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POPULAR Computing WEEKLY

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Vol 3 No 37



Hesitant start for the Plus/4?

PRODUCTION delays now seem likely to ensure that Commodore's new Plus/4 micro will be in short supply this Christmas.

Work on the machine's four built-in Rom software packages was not completed until the end of August and this has delayed first production machines until October. Even then it may be some time before the Plus/4 can be manufactured in volume.

As a result, Commodore is now concentrating its efforts for Christmas on its 64 and new C16 machines.

The C16 is to be backed by a heavy TV advertising campaign. While advertising for the Plus/4 will be confined to the national and specialist press.

"We feel there is a smaller market for the Plus/4, and this has been taken into account with the launch," said Aileen Bradley of Commodore. "It is far more of a serious home Computer, and not just for playing games."

The expected price for the Plus/4 has also risen since Commodore first previewed the machine in June. Then Commodore hoped it would sell at £249—now it will be priced at £299.99.

"Our initial price guidelines were underestimated and also currency exchange rates have made it more expensive now," said Aileen Bradley.

Commodore's C16 ousts Vic 20

COMMODORE has confirmed that—with the launch of its new C16 micro this week—production of the Vic 20 has been ceased.

"The C16 will supersede the Vic 20," explained a Commodore spokesman. "The Vic will be sold in the shops while stocks last, then the C16 will take over. There are no plans to manufacture any more Vic 20s."

Of the major High Street retailers, Boots and Dixons both confirmed that they would be selling off their existing stocks of the Vic and taking the C16 in its place.

The C16 is to be sold—like the Vic—as part of a starter pack costing £139.95.

Along with the machine, the package will include *Introduction to Basic Part I* and four other software titles—*Picture Builder*, a graphic design aid, two arcade games, *Punchy* and *Zap*, and a chess program.

Gremlins at work again

SUICIDE EXPRESS will be the next release from Tony Crowther, the Sheffield based Commodore 64 author, now working for Gremlin Graphics, responsible for top-selling titles like *Loco*, *Potty Pigeon* and *Monty Mole*.

He describes the new game as "*Loco* in the year 2000"

COMMODORE PLUS/4 REVIEW

INSIDE) AMSTRAD PAGE) RAPSCALLION) ART ON BBC)



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POPULAR Computing WEEKLY

Vol 3 No 37

) View

After the Spectrum, the 64 and the BBC, which are roughly competing machines, the big 'three'—are now moving apart.

Commodore has been the most conservative. Its new 16K/C16 is a Vic20 replacement intended as a 48K Spectrum-basher. Commodore's Plus/4 is really a tidied-up 64 with a less impenetrable Basic. Its four built-in software packages appear to be so simple that I can't see that they add much to the machine.

Sinclair is considered by some to have gone a bit off beam with its QL. Yet the machine takes Sinclair into the impressive 68000 chip family. 128K is not to be sneezed at, the four Psion programs are workable and the machine is cheap.

Then there is Acorn. Acorn's ABM, expected to be previewed next week, is a full-blown business micro complete with built-in disc drive and bundled monitor. The machine is a direct development from the BBC and second-processor options—again the 6502 will be used to control, via the Tube interface, a choice of second-processor configurations.

The three companies' approaches differ considerably.

Commodore's Plus/4 is a conventional games/recreation machine which comes perilously close to stealing market from its existing 64 machine. Sinclair's QL is an original (and mostly successful) attempt to offer a powerful applications machine at a realistic consumer price. And Acorn's ABM is intended as a low-cost work horse for business based on the BBC's proven technology.

Which will succeed—the tried and tested or the innovative and unconventional?

) Presents...

) Futures...

Dark secrets of the QL's Rom revealed. . .The latest Lo-Profile Spectrum keyboard from Advanced Memory Systems put under the microscope . . . a micro version of the dice game *Yahtzee* is Star Game for the BBC

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Software for M&S

MARKS and Spencer is to enter the software field, with three packages being launched under the St Michael label this autumn.

The three titles — *Games Pack*, *Start to Program* and *Games Maker*, will all initially be available only for the 48K Spectrum.

"The games are being launched on a trial basis. They will be sold first in just half a dozen stores. If they are successful, then more of the larger stores will stock the range," explained Chris Maynard of Grisewood and Dempsey Computer Publishing, which wrote the games for Marks and Spencer.

"We have worked in conjunction with a number of software companies to produce these games. *Games Maker*, for instance, is a modified version of Quicksilva's *Games Designer*. The two games on *Games Pack* — *Fearless Frank* and *Frozen Penguin*, were originally published by Visions for the Commodore 64 — this is their first appearance on the Spectrum.

"*Start to Program* is based on a series of short programs we published in a book called *A Beginners' Guide to the ZX Spectrum*. The micro version was originated by ourselves and Triptych Publishing."

Grisewood and Dempsey has also set up a joint publishing venture with Pan Books to produce four software packages under the Piper Software label. These titles, *Aircraft*, *Astronomy*, *Birds* and *Dinosaurs*, for the Spectrum and Commodore 64, have more of an educational slant. They comprise games, database material, and an illustrated book. Each package will sell at £7.95.

The Marks and Spencer titles are due for launch in October at £6.99 each.

Stores pin hopes on new micros

A PICTURE of which micros will be available in which stores this Christmas is beginning to emerge. MSX machines from four manufacturers — Toshiba, Sony, Sanyo and Mitsubishi — will be available in limited quantities.

Commodore's new C16 and Plus/4 machines and Sinclair's QL will also be in the shops — the C16 and QL well before December.

Currys aims to have 2000 Toshiba HX-10 machines available this month. Boots and Dixons will also both take the HX-10. For Boots it will be the only MSX machine it will take. Dixons, however, also plan to be stocking the Sanyo MPC-100 and the Sony Hit-Bit in October.

W H Smith will also be taking the MPC-100, and both Mitsubishi's 64 and 132K models.

The Sinclair QL will be taken by W H Smith, Boots and Dixons, so far, and Laskey's is considering the machine.

The Commodore C16 will be taken by Currys, Boots, Dixons, W H Smith (October), and probably Laskey's and Rumbelows. Commodore's Plus/4 will be taken by Currys, Boots Dixons and probably Laskey's and Rumbelows. W H Smith has decided not to take the Plus/4.

Retailers are however apparently treating the Oric Atmos machine with caution. Currys has dropped the machine from its range and Dixons has not yet decided whether it will stock the Atmos this autumn or not. Meanwhile Lasky's has reduced its price for the Atmos to £119.90 — "We'll see how it sells at that price before deciding whether to drop it or not," commented a Laskey's spokesman.

● Most of the major chain stores have now dropped the 16K Spectrum — the machine is now virtually unobtainable in this country.

Apricot set for PCW show

MANY companies will be using the Personal Computer World Show, at Olympia which begins on September 19, to launch their Christmas products.

Acorn and Enterprise will both have long-awaited microcomputers making their debuts at the show—the Enterprise 64K and Acorn's business machines, currently being tagged as the ABM series.

Apricot will be demonstrating its new F1, F1E and portable micros. The F1 has 256K Ram, a 3.5 floppy drive and business software bundled with it.

Touchmaster, the company headed by former Dragon Data directors Brian Moore and Richard Wadman, will have its graphics pad on show, while Sinclair will be selling QLs from the stand.

On the software side, Quicksilva is launching its range of autumn games, and *Sherlock Holmes*, will, at last, make its first public appearance.

Psion will have its Xchange business software—for the IBM PC and Sirius—on show. Xchange *Quill*, *Abacus*, *Archive* and *Easel* are enhanced versions of the bundled QL software for the business market.

The Personal Computer World Show opens to the public on September 20 at 10.00am. The entrance fee is £3.50.

QL takes off

THE first signs that the QL may be taking off could be seen at the 12th ZX Microfair, held last Sunday at Alexandra Pavilion in London.

Not only was the QL on sale over the counter for the first time — from the Sinclair stands but over ten of the exhibitors had QL material to show.

Two QL assembler packages were on display — one from Metacomco at £59.95, the other from Hisoft (as yet unpriced). GST showed its alternative operating system for the QL available on a plug in board for £39.95, and a new software house Spectrascan demonstrated a range of QL games on microdrive at £12.

Softek edge ahead

THE latest release from Softek's new programming team The Edge is *Psytraxx* for the 48K Spectrum.

Psytraxx uses The Edge's so-called 'Synergy' programming technique, which effectively gives the game over 1000 screens. Described as a 'giant maze adventure', the action takes place inside a robot's brain where the player must locate the robot's CPU and destroy it.

Softek International has split its various interests into two seperate autonomous divisions. All further software releases will come out under the name The Edge, while still being marketed by Softek.

The forming of a separate group also involved a staff shake-up. Softek retained only a few of its programmers to work in The Edge while Marten Davies, formerly UK Sales Manager at Activision, was brought in to help set up the group.

Psytraxx should be available this month, priced at £7.95.

●The Edge is also considering converting its first release, *Quo Vadis* for the MSX machines.

Fantasia games live on

ADVENTURE house Digital Fantasia has gone into liquidation.

Its range of Mysterious Adventures has however been saved. Prior to the company's demise, Channel 8 Software took over the series. Channel 8, which produced Commodore and Atari versions of the adventures, will not only continue marketing the series of 11 titles, but also release three additions to the range.

The new titles will be *Midwinter*, *After the Fire* and *Beyond the Infinite*, to be produced on Commodore 64, Atari, Dragon, Spectrum, BBC and Atmos.

Letters

Handmade Vic

Like M J Davies (letters, August 23 issue) I have experienced trouble with breaking wires on my Vic20 modulator. I eventually decided to fit it inside the Vic20 case.

This was easily done by screwing the modulator to the lid. A co-axial socket was then also fitted on to the lid and the relevant wires to the modulator were soldered to the back of the DIN output socket on the Vic pcb.

Elegant it may not be, but it was well worth the effort and my Vic is now trouble-free.

R Mather
138 Clensham Lane
Sutton
Surrey

Programming structure

I feel that I must write to you after reading Mr George's letter attacking good programming style.

Mr George first attacks structured programming, saying that Basic should throw away all pretence of being a structured programming language because it includes *Goto* statements. Though they are completely superfluous except in error trapping, structured programs are far easier to write, debug and follow. It calls for a more reasoned and logical approach to solving problems. The pity is that beginners are not taught to program in a block structured programming language first of all.

As I think Mr George knows, recursion does not involve merely executing the same piece of code several times, it is when a procedure or function is able to call itself in order to perform a task. Recursion gives the same advantages that structured programming affords — which is probably why Mr George dislikes it so. There is also a bug in his program: the program does not work for the factorial of zero.

Mr George seems to prefer a ZX81, which originally sold for £100, to a 16K Spectrum for the same price. The Spectrum is the product of technology much superior to the ZX81. Does Mr George dislike technology as much as the excellent microcomputers it has brought.

I'm afraid that I cannot agree with any of the points in Mr George's letter with its Pythonesque "Ee, when Ah wer a lad we didn't have any of this graphics stoof, the knaws we 'ad a wun byte memory mapped display an' wer proud of it" observation!

P Bhagat
Clare College
Cambridge

"It's most embarrassing — they want an Oric, a Vic 20 and a 16K Spectrum to give as Christmas presents."

Shades of Superbasic

When asked *Ver$*, my QL responds with AH — all very well, but which version?

There must be differences — John Lawlor (issue 35) writing about procedures in issue 34's QL page finds problems only with *Merge* and *Dline*, while my QL says that all microdrive commands must have on strings attached. So most of the procedures were of no use. Incidentally, I have no problem with *Auto 30000*, so long as the increment is not too large.

Here are two instructive examples of Superbasic readers may like to stow in the 'boot'. They force upper and lower case from string inputs containing letters.

```
10 Input x $. Upc x $ Print x $
20 Input y $. Lwc y $. Print y $
30 Def Proc Upc (a$)
40 For x= 1 to Len (a$). If code(a$
   (x))>90
   a$(x)=Chr$(Code(a$(x))+32)
50 End Def
60 Def Proc LWC(a$)
70 For x= 1 to Len(a$): If Code (a$):If
   Code (a$(x))<97 Y a$(x)=
   Chr$(Code(a$(x))-32)
   End def
```

Entering mixed upper and lower case letters will cause one string of each to be printed. Such commands as written in my manual give error reports; the following may be helpful to some QL owners.

RENUM *start* TO *end*; *base*, *step* — with semi-colon after 'end' L/N

SAVE Mdv1 *name*, *start* TO *end* — with comma after 'name' to save parts or lines of a program.

Brian Johnson
2 Block X Peabody Avenue
London SW1

Thrashing around

How threatened John Beckett of Manchester must feel to be thrashing around in all directions — 'Support the Electron' *PCW* Vol 3 no 36.

Perhaps his feeling that the world has let him down is linked to the item in 'News Desk' where we get a bit of an insight into the way in which the Acorn company thinks, that it is putting up the price of its second processor option to 'enable dealers to receive a larger margin on sales'. It even has the cheek to wrap this up as a service to the customer!! One assumes that it would never strike Acorn that a better way of helping both dealer and customer would be to be less greedy on the wholesale price of its products?

Both of the BBC and the Electron are excellent machines as in their own way ware all the other machines that Mr Beckett rages against, but it is surely obvious to everyone that they are *Very* overpriced.

Geoff Crowther
60, Fleckney Road
Kibworth Beauchamp
Leicester

Heavy on pink

I have been reading your magazine since it was A4 size, with nice titles on the cover in green, red and blue.

The reduction in size spoiled my home-made binders. Never mind, I thought it's still a great mag. But the last straw was Vol 3, No 32. Being a biker (long hair, into heavy metal etc) I felt a right nancy walking up to the counter with a PINK edition.

Timuty Sheldon
Peel Cottage
Holyhead Road
Albrighton
Wolverhampton

PS Is someone doing this magazine for a bet?

The odds against another pink edition occurring are two to the power of 250,000 to 1 against and falling. We have normality. Anything you still can't cope with is therefore your own problem.

Learn to Fly Competition: Week 2

Competition week 2 and here are this week's vouchers.

Collect the four weeks' vouchers and fill out the coupons printed in the last week. Send the form and the four 'plane' vouchers and you could win a go on a real flight simulator—as used by British Airways to train their commercial pilots!

Send in the form and the second set of four vouchers and you are entitled to unbeatable discounts on Hewson Consultants flight simulation and air traffic control software for all the major micros—offer available only to *Popular Computing Weekly* readers!



Slide

Try to solve the sliding-block puzzle in this game for the Oric by B Johnson

The program simulates the well-known sliding block puzzle, and shows a few of the facilities of the Oric-1. It has three levels of difficulty and lets you quit if you just solve it!

Program Notes

100 Keyboard and Screen POKES. Look at addresses from #268 to #270 for some useful POKES
105-120 Set-up
140 A different start each time
150-166 Sets difficulty and screen colours
250-280 Jumbles the puzzle
300-360 Puts it on screen and checks for finish
370-410 GETs your choice
420-450 Moves it
475-478 Music
800 CALL #F430 is Warm Start vector — saves all that messy PRINTCHR$ (17)(4)(30)(6). PAPER, INK business!!



```
100 POKE#260,88:POKE#26F,28:CLS:POKE#26A,74
101 REM POKES FOR SCREEN AND KEYBOARD SET-UP
105 DIMA(35):PAPER3:INK0:CLS
110 FORI=1TO35:A(I)=-1:NEXT
120 FORI=1TO4:FORJ=1TO4:A(6*I+J)=60+4*I+J:NEXTJ,I:I=28:A(I)=0:IFZZ=
1THEN130
122 PRINT:PRINT:PRINTSPC(13)CHR$(27)"JSLIDE"CHR$(4)
124 PRINT:PRINT:PRINT"All you have to do is to re-arranee    "
125 PRINT"the pieces into vertical alphabetical ":PRINT"order.":PRI
NT:PRINT"Just press the "1
126 PRINT"letter that you want to ":PRINT"move.":PRINT:PRINT"Q to q
uit..."
127 PRINT:PRINT:PRINT"Press any key to play.":GETA$
130 CLS:PRINT:PRINT:PRINT"1=Easy  2=Normal  3=Hard"
140 A$=KEY$:R=RND(1):IFA$=""THEN140
150 IFASC(A$)<49ORASC(A$)>51THEN140
160 F=VAL(A$):IFF=1THENPC=3:BC=20:F=20
161 IFF=2THENPC=2:BC=21:F=50
162 IFF=3THENPC=4:BC=17:F=200
165 C=0:PAPERPC:CLS
166 FORQ=8TO16:PLOT22,Q,PC+16:PLOT12,Q,9:PLOT13,Q,BC:NEXT
250 FORJ=1TOF
260 K=INT(RND(1)*4+1):L=(K=1)-(K=2)+6*(K=3)-6*(K=4):IFA(I+L)<0THEN2
60
280 A(I)=A(I+L):A(I+L)=0:I=I+L:NEXTJ:GOTO370
300 PRINTCHR$(30):PRINT"Move ";L;:K=0:H=5:FORI=1TO4:FORJ=1TO4:Z=A(6
*I+J)
310 IFZ=0THENZ=32
320 POKE#BCCA+H+J*80,Z
321 REM  use #3CCA for a 16k ORIC
330 IFA(6*I+J)=60+4*I+JTHENK=K+1
340 NEXTJ:H=H+2:NEXTI
350 IFK=15ANDA(28)=0THEN460
360 PRINT"   Letter?  "CHR$(8);:RETURN
370 L=0
380 GOSUB300
390 A$=KEY$:IFA$=""THEN390
400 IFA$="Q"THENPAPER3:CLS:PRINT:PRINT"You quit after "L"moves.":GO
TO490
410 IFASC(A$)<65ORASC(A$)>79THEN390
420 PRINTA$;:PRINT:PRINT:PRINT:FORI=7TO28:IFA(I)=ASC(A$)THENJ=I
430 IFA(I)=0THENK=I
440 NEXTI:I=J-K:IFABS(I)<>1ANDABS(I)<>6THEN380
450 A(K)=A(J):A(J)=0:L=L+1:GOTO380
460 POKE#26A,74:CLS
470 PRINT:PRINT:PRINTSPC(11)CHR$(27)"NWELL DONE   "CHR$(4):PRINT:PR
INT
474 PLAY0,0,0,0
475 TU$="1358135813581"
476 FORI=1TOLEN(TU$):P=ASC(MID$(TU$,I,1))-47:MUSIC1,3,P,0:MUSIC2,4,
P,0
477 PLAY3,0,1,1500:WAIT12:NEXT
478 WAIT200:PLAY0,0,0,0
480 PRINT:PRINT"You finished in "L"moves."
490 PRINT:PRINT"Another go? (Y/N)"
500 GETA$:IFA$="N"THENCALL#F430' WARM RESET
510 IFA$="Y"THENCLEAR:ZZ=1:GOTO105
520 GOTO500
```

A Siel barks

***Graham Taylor** talks about music keyboards and computers to Vince Hill from Siel*

For many people a major consideration in buying their micro was the possibility of experimenting with sound and music composition in a cheap, easy to understand, way

Programs which 'turn your BBC into a synthesiser' or let you 'compose and edit your own compositions' have always done well, if not actually shot into the top of the charts.

People like to play music with their micros but, obviously, there are major problems — the Qwerty keyboard isn't very suitable for playing music, the sound chips are not really that powerful, and it is difficult to use computer music in conjunction with other instruments

A solution to all these problems which should also be soon quite cheap is provided by MIDI the digital communication standard which allows not only the linking of keyboards but also keyboards and micros.

In fact MIDI means much more than being able to add a keyboard to your micro — it means using your computer for composition, automatic notation, sequencing, and all kinds of other wonderful things.

In the past MIDI keyboards have been expensive and it is only recently that computer interfaces and software are becoming available Now prices look like falling dramatically in a race between Yamaha with its CX5 MSX machine and expected new low-cost keyboards from Casio and Siel.

Siel's Vince Hill is one of those actively involved in promoting MIDI in this country, and I asked him how computers fitted in. "There are some interesting similarities between the keyboard and computer industries — the computer industry is much newer but with something like MSX the two areas overlap "

MIDI can be dated not by the release of any one item of equipment, but by the signing of the MIDI charter — literally a piece of paper that most major keyboard manufacturers signed in which common electrical fittings and standards were agreed. "It had a long gestation period before it finally emerged and even then some of the early MIDI machines didn't really communicate properly with one another — information like keyboard velocity, the speed at which you press the keys on a touch-sensitive machine — has taken a while to get right."

Electronic music is digital information, information in the form of binary digits, and the same language is used by both keyboards and computers — they sometimes even use the same or similar microchips It was inevitable, therefore, that the two should be linked.

The MIDI computer link gives musicians a powerful composing tool and polyphonic sequencing, and arranging "What you have to remember is that the keyboard market has one big problem associated with it — the people who are going to buy it need some skill — some sort of technique or flair for music" The cheap-end portable keyboard manufacturers have spent a lot of time producing endless devices providing new ways of making it easy for the non-musician to quickly acquire enough skill to play satisfyingly — auto chord and bass accompaniment, lights that flash as each note is played by the machine, LED's that tell you what key your playing in etc etc.

One of Siel's Soft MIDI software packages — a programming tool for their MK900 synthesiser

MIDI will enable software houses to create music education programs that are the TV monitor and test and encourage budding musicians on a real keyboard. Not only will these programs ask you to 'play the key of C' but they will also judge how smoothly and quickly you managed it and give you appropriate advice.

"The computer users can gradually be drawn through, just playing about with sounds, to a real understanding and sense of purpose with their music — with the right software it could be like having a music teacher in your home, twenty-four hours a day."

If the MIDI keyboard-computer link really takes off then it will quite probably change the way the keyboard manufacturers think about the way their hardware is marketed.

"If you take something like the cheap Casio keyboards with their dozen or so preset sounds and rhythms you can see what might happen — Casio put on a number of presets because they know that the market they are aiming for wants something nice and simple — they are not looking for a DX7 where they have to spend five hours constructing the sounds.

"So Casio choose some basic sounds and put those in as presets even though the chip that generates them is probably capable of



making quite a few more, it's a compromise for the sake of simplicity

However, if the keyboard has MIDI then it's easy to give it extra facilities via the computer so that it is possible to experiment — MIDI opens up the lower-cost keyboards for more complex applications."

A computer link should make cheap sampling possible too Sampling is where an analogue sound is fed into a machine via a microphone, or from tape, and turned into digital information and stored — then it can be altered or converted into notes for a keyboard and played — you could store, for example, the sound of a voice playing a single note and then play it at any note over as many octaves as you want. This is the same technique that is sometimes used to put voices into computers without using hardware.

Next year Siel is planning a range of keyboards capable of being controlled by computer with prices starting at about £190 Also a substantial portable keyboard with MIDI called the MK900 is available from Siel for just over £400

This keyboard will be able to use the existing Siel software/hardware interfaces for the Spectrum and Commodore 64 (the BBC version is expected soon) and a growing range of educational software.

"There will be an increasing number of computers supported — Siel would very much like to do something with the QL. With multi-tasking and windows we could do wonderful things and with 128K — we can store a vast amount of music — unfortunately Sinclair are not very helpful though."

For those who, like me, fancy the idea of making music and want something else to do with our computers MIDI is going to offer a lot of new alternatives. And by next year it should be cheap too

In the end though what you get out of it will depend on you. As Vince says, "No matter how much technology you have in the final analysis it's up to you and what you do with it — music is the whole thing, the only objective there is."



PLEASE USE THE AUTOMATA ORDER COUPON ON THE BACK COVER

Solid and sturdy

***David Lawrence** takes a look at the machine on which Commodore is pinning high hopes — the new Commodore Plus/4*





It is inevitable that the Plus/4, Commodore's new home micro should have to face comparison not only with the machines of competitors, but also with its own best selling Commodore 64

With that in mind, perhaps it is only fair to say from the outset that the new Plus/4 is *not* a bigger and better version of the 64. Rightly or wrongly, Commodore has chosen to go down a very different path than that which the 64 might have indicated.

Gone are the sophisticated Sid and Vic chips which gave the 64 the sound capabilities of a synthesiser, and graphics wonders like sprites. The problem with all these marvellous facilities was always that they were never integrated with Basic and it was only the best of programmers who could ever really make use of them.

With the Plus/4, Commodore has aimed a machine squarely at the average user. Experienced programmers will find many nice touches and elegant programming structures to play with but it is the ordinary domestic uses who will notice the real difference. Here is a machine which has all of its major facilities available from a new Basic, version 3.5 and a full 60K available for programs on the 64K versions.

I have been working and playing with the finished version of the Plus/4 (without the built in software packages) and its smaller brother, the C16, for some three months now, and during that time it is fair to say that it has grown on me immensely. The first impression, and a continuing one, is of good design, solid manufacture, thorough preparation before release and the capacity to listen to the pleas of existing owners on the limitations of the 64. Physically the Plus/4 has a robust feel to it and while the keyboard seems little slack, it has not revealed weaknesses under intensive usage

Specification

The Plus/4 appears to have been styled by the same team responsible for several of the Japanese MSX machines. The almost black casing has space ship lines and sets off the main keyboard of 58 ivory coloured keys plus space bar to perfection (well anyway I like it). Eight programmable function keys (four keys, two on each) a convenient cluster of cursor keys, and a power light complete the top. The main keyboard is slightly dished for easier typing

Briefly, the Commodore Plus/4, like its relative the Commodore 64, has 64K Ram. But whereas the C64 has only about 39K of Ram available for programming in Basic, the Plus/4 has 60K available to Basic.

The machine has a 32K Rom containing the operating system and Basic and the machine also includes four in-built software packages contained on Rom chips

It is from these four software packages that the machine takes its name — they are a word-processor, a simple spreadsheet, a database program and a graph-plotting package

Seven function keys are provided — together with a *Help* function key

The Plus/4 also has a simple built-in machine-code monitor with 12 commands.

The machine is based around the 7501 processor chip — a development of the 6502 used in the 64 and the Vic20

Up to 121 colours can be displayed. The maximum graphics resolution is 320 × 200 pixels and the text display mode is 40 × 20 characters

Sockets are provided at the back for monitor, joysticks, disc drive/printer, RS232, power, and cartridge. TV output comes from the left whilst an on/off switch occupies the right along with a reset button. And all that finning along the top also acts as a grill for ventilation.

Separate manuals are provided for Basic and the *3-Plus-1* integrated software. These give tutorial instruction for beginners and reference sections for memory lapses. The Basic manual is well presented and gives sufficient information to use the machine

Plus/4 Integrated Software

The Plus/4 comes complete with built-in software (named *3-PLUS-1* by Commodore) for word processing, data filing, graphics, and setting up spreadsheets.

The software has the advantage of a high degree of integration — that is the programs can exchange data, tend to use common commands and are all resident in memory at the same time.

The software is, of necessity, rather limited in scope though because it is supplied on a couple of solid-state Rom chips fitted inside the machine

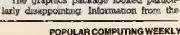
The advantage is that access to the packages is instant — at the touch of a function key

The disadvantage is that the size of the programs has had to be kept pretty short — a far cry, for example, from their equivalent programs on the QL.

Judging from a demonstration of the four Plus/4 software presented by Commodore at June's Chicago CES show the programs will, as suspected, be rather primitive.

In the word-processor for example, such refinements as right-justified, centred or highlighted text are not available

The graphics package looked particularly disappointing. Information from the



spread sheet can be displayed only in the form of a bar chart (pie charts are apparently not possible) where the bars are built up out of ordinary character square size # signs. Each bar can therefore only be accurate to plus or minus the height of one character square. Only one set of data can be represented at a time.

Ease of programming
When the time comes to program the new machine, existing Commodore owners will be relieved to know that the Plus/4 keeps to the same tried and tested full screen program entry and editing methods.

Commodore has recognised that strength and even built upon it with a whole series of extra editing capabilities called up by *Escape* sequences (*Escape* followed by another key).

The overall effect is that developing a program is even easier on the Plus/4 than on the 64 and, accordingly, streets ahead of most of machines on the home and personal market.

Programming structures
Many of the new machines coming onto the market this year have followed BBC Basic in moving away from the use of *Gotos* and *Gosubs* as a programming style by means of *Do* loops, extended *If* statements and procedures.

With Basic 3.5, Commodore has opted to not provide procedures or even an extended *If*, a fact that will disappoint many purists, but instead has chosen to concentrate on flexible repeat loops.

As well as the standard *For... Next* loops, the Plus/4 supports *Do... Loop*. Conditions based on either *While* or *Until* (eg *Do While X>10* or *Do Until X<=10*) may be attached to the beginning or end of a loop so that there is almost no action based on a decision which cannot be expressed in a straightforward form.

In addition to terminating a loop with the *Loop* instruction, the *Exit* command allows execution to jump to the line following the end of the loop. Combinations of *Do* loops with *Exit* allow the simulation of the extended *If* found on some new machines. This flexibility in the loop instructions means that the Plus/4 is the first home micro from Commodore where the *Goto* command effectively becomes redundant.

The other major programming structure provided is *Trap... Resume*. *Trap* [line number] at the beginning of a program section will send execution to the specified line whenever an error is detected which would otherwise have stopped the program. Having detected an error, the system variables *Err$*, *Err* and *El*, which will return the current error message, the error number and the line in which it occurred, allow the program to selectively deal with different kinds of problems. Finally, with the error having been dealt with, *Resume* allows program execution to recommence either at the line which has produced the error, at the following line, or at any specified line within the program.

Graphics
In return for the loss of sprites, which everyone praised and only a small proportion of 64 owners ever used, Basic 3.5 provides a useful set of graphics capabilities which can only be described in outline here.

Line and shape drawing commands include *Draw*, *Circle* and *Box*. *Draw* is a standard line-drawing command, while *Box* allows the drawing of a rectangle on the basis of the co-ordinates for two opposite corners. Most flexible of all is the *Circle* command which will draw any regular shape from a straight line to a circle, including the facility to rotate the shape or to stretch it along either of its axes.

Closed shapes may be coloured by use of the *Paint* command.

Graphics modes
Like the 64, the Plus/4 does not automatically reserve memory for a high resolution graphics screen on start-up. The default screen mode is a standard 25 lines by 40 characters. Other screen modes are set by use of the *Graphic* command.

Graphic 1 provides a full 320 × 200 high-resolution screen, occupying 10K of memory in total (including colour attributes). The full range of colours is permitted on the screen in this mode with the limitation that only one foreground colour is available in each character square. Text is supported in all modes by the *Char* command, which also supports screen positioning in low and high resolution.

Graphic 2 mode is similar to *Graphic 1* except that the bottom five lines of the screen are maintained in normal text mode and can be written to by use of *Print* statements.

Graphic 3 is a half-resolution multi-colour screen which allows two foreground colours to be resident in the same character square in return for a minimum resolution of two pixels horizontally, which makes for rather unsatisfactory lettering when text is displayed.

Graphic 4 is the split-screen version of *Graphic 3*.

Finally, *Graphic 0* returns the screen to normal text mode.

One useful feature of all these screen manipulations is that once reserved, the high-resolution screen is not overwritten unless the memory allocated is freed with the *Graphic Clr* command. It is possible to shuttle between high- and low resolution screens without damage to either, a useful facility for the would be games writer.

Colour and low resolution
The colour and low-resolution capabilities of the Plus/4 are outstanding, even better than on the 64.

The full Commodore low-resolution character set is available, making possible a great many effects which would only be available in high resolution on other machines. Sixteen main colours can be displayed, all of them specified from Basic with the *Color* command (yes, unfortunately it is the American spelling). In addition, however, the 'luminance' (brightness) of a colour can be specified, providing a total of 120 shades plus black.

Other graphics commands
Apart from the standard drawing commands, there are a variety of other useful graphics facilities. *Rclr*, *Rdot*, *Rgr* and *Rlum* are functions which return information on the current print colour, the position and colour of the pixel at the current cursor position, the current graphic mode and the currently prevailing luminance.

SShape and *GShape*, similar to the Microsoft *Get* and *Put* commands first seen in this country on the *Dragon*, allow small areas of screen to be stored in the form of string variables for later replacement.

Sound
As with the graphics capabilities, the Plus/4 is a simpler machine than the 64 when it comes to sound, and most users will find it easier to use.

continued ▸

The main command is called, simply, *Sound* and specifies the number of the voice to be played (there are three, including a white-noise channel), the value of the note and its duration. Unfortunately the *Sound* command does not support a sensible set of values for musical notes, so the user has to resort to tables of values and calculations if music is to be played. The shape of note produced, although fixed, is more pleasant than the average *Beep* and some attractive results can be achieved



with very little effort compared to the complex settings necessary for the 64's Sid chip

Disc commands

The Plus/4 must be the first home micro to be launched in this country to take account of the growing emphasis on disc — rather than tape-based systems.

The machine will work with the current generation of 1541 drives (via the serial port) or with a promised new breed of drives which will use the parallel port and transfer the data at twice the speed. All the normal disc commands have been made a part of normal Basic, rather than having to be sent down a specially opened channel in a relatively inscrutable form. In addition, the disc operating system error numbers and messages are available in the system variables *Ds* and *Ds$* to cope with any problems which may arise during disc access.

Basic

There is very little in Basic 3.5 which could be described as new. Rather it would seem that Commodore has gathered together some of the features which users have come to expect form the better dialects of Basic. Some of the more interesting features are.

Auto — auto line-numbering facility

Dec — function returns the decimal value of a hexadecimal string.

Delete — removes specified lines from the program.

Getkey — creates an indefinite wait for a key press

Hex$ — function returns the hexadecimal form of a decimal number

If ... Then ... Else — *If ... Then* extended by the provision of *Else*.

Instr — string search function, returning the position of one string within another

Joy — function returning the current position of the joysticks.

Print Using — compared to many other versions of Basic this is quite a powerful version of this useful formatting tool, extended even further by the addition of the *Pudef* command, which allows characters in a standard *Print Using* format to be redefined

Renumber — standard renumbering of lines, *Gotos* and *Gosubs*.

Tron and *Troff* — the standard debugging facility, printing out the number of lines being executed as the program progresses

Restore — the added facility to specify the line number from which *Data* will be read

The Monitor

The built in machine code monitor, *Tedmon*, is not and does not claim to be a full assembler package but instead more of a powerful tool for the development of shorter pieces of coding. Each line of assembly language has to be entered, checked and processed separately, making any extensive coding, and especially alternations to existing programs, fairly tedious

Having said that, *Tedmon* does provide an assembler and, in addition, a disassembler and a wide range of machine-code monitor facilities like searching and displaying memory, transferring blocks of memory, filling memory areas with specified values, saving and loading memory areas to disc or cassette, and displaying the current state of the registers. Machine-code programs can also be executed from within *Tedmon* but, unfortunately, there is no trace facility to allow a faulty program to be stepped through, a major limitation in the frustrating process of developing new code

Whatever the limitations, however, the instant access to *Tedmon* and, through *Tedmon*, to the memory and machine-code/assembly language programming and the standard 6502 mnemonics, ensure that the Plus/4 is going to be a popular machine with machine-code buffs of all ages and levels of skill

Conclusion

Who is going to buy Commodore's new baby? Well, with its friendlier Basic it becomes an obvious candidate for the first time user who wants a well thought out and produced machine with the inevitably high level of software support that accompanies any new Commodore machine.

Existing owners of the 64 who are more interested in the quality of the *Basic* on their machine than the cleverness of the sound and sprites, may well be tempted by the fact that Commodore's emphasis on compatibility has ensured that existing peripherals like printers and disc drives (though not the cassette recorder) will all work with the new machine. In fact, even Basic programs from the 64 can be transferred to the Plus/4 and will run without difficulty provided they make no use of *Peeks* and *Pokes*, which may well crash the system.

As for other users, the Commodore Plus/4 is not going to set fire to the imagination of micro-snobs who are interested only in new and exotic developments in Basic.

What it will do though, I think, is allow a great many owners of existing machines, whether it be a Spectrum, a Dragon, an Oric or whatever, to move up comfortably to a more powerful and more amenable machine.

The success of the machine will of course also depend on the quality of the built-in software packages — they are one of the main selling points of the machine.

Being on Rom they are quick to access but fairly simple in scope and this may limit the serious application of the machine

Imperial

Program *Empires* **Micro** Spectrum **Price** £19.95 **Supplier** Imperial Software.

Ever fancied coal mining the universe? Well take a look at *Empires* — an unusual four-player game from Imperial.

As an intergalactic Ian MacGregor your mission is to mine other solar systems for their mineral wealth, not forgetting to build large military fleets to protect your expansion from like-minded alien tycoons.

For your £19.95 you get a fancy packet containing three player cassettes an umpire cassette and various cardboard maps and cards which certainly look impressive, but which, according to the instructions, are not essential to the game

Each of the three players takes it in turn to load a cassette into the Spectrum, choose their fleet movements using a system of menus and a cursor, and save this information on another cassette which is then passed on to the umpire for processing

The umpire then loads all players' data files, calculates the outcome of any moves or battles, and returns the results on cassette to each player

This procedure is then repeated for each move There is also a facility for sending messages to each player via the umpire for the purpose of making alliances or gratuitous insults.

Empire players will need to be pretty dedicated, as with one move every couple of days a game can go on for weeks.

An unusual idea, but the hassles involved ar actually involved in actually specialising the logistics of the game remove most of the fun.

Nigel Lackey

Word Play

Program *Computer Scrabble* **Micro** Commodore 64 **Price** £12.95 **Supplier** Leisure Genius

Computerised board games or card games are often difficult to justify, since they usually only provide a less convenient way of playing the standard game, without giving you any extra facilities.

However, *Computer Scrabble* from Leisure Genius is worth looking into, because it actually does give you much more than just a way of playing the game on a TV screen.

Although at its simplest it can be used as a means for two to four people to play *Scrabble* on the TV, the program can do much more than this. Most importantly, the computer can play the part of one or more (even all) of the players. It can play at one of four skill levels, and each computerised player can have a different skill level if required.

At the highest skill level the computer provides quite a challenging opponent, although rather a slow one! It has a vocabulary of 11,000 words, which isn't vast, but is big enough for a reasonable game.

There are a number of other playing options. One of the nicest is the facility to watch the computer 'thinking', ie, you can see the words it makes up and tries until it finds the best. If you wish to, you can see all your opponents racks, but this seems a be like cheating. You can also choose whether or not to have sound effects and how fast the computer places its words on the board.

All in all, this is an impressive program. It simulates a pretty good *Scrabble* player, and provides a number of nice features which aid the game The board and racks of letters are clearly presented, and the whole package is very easy to use

Richard Corfield

Cash in hand

Program *Simple Business Accounts*, **Micro** Spectrum **Price** £11.95 **Supplier** Flowchart Limited 62 High Street Irthlingborough, Northants

In the midst of the invaders and aliens there is a constant call for serious software for the ZX Spectrum, and this program is aimed fair and square at that market.

In itself it represents a good piece of programming, demonstrating just what can be done with Basic but I am not sure quite where it expects its market to be

Entering data is tedious in the extreme, even with the use of an add-on keyboard. The program is designed to be very user-friendly: most options are selected by a single key-press and data is entered direct to the screen rather that by *Input* statements The difficulty with the combination of this and Basic is in the speed at which events happen — or rather the lack of it. Most small businesses would get on faster with a cash book

One advantage of computing the accounts is in accuracy, but this requires a "single entry" system, where data is entered just once. Simple Business Accounts, however, requires you to keep a hard copy print-out each week and then re-enter all the weekly totals at the end of the year It is a shame that a reasonably competent program should be spoiled by this omission especially when full microdrive support is given. Why isn't there a routine to load each week in turn onto Microdrive and take the information off these directly?

The manual that comes with the tape is just eight sides long, and although it claims on the back that the program is fully tested and approved in use in small business with turn-overs up to £1 million, I find that hard to believe. The booklet also claims disc drive support, but there is on evidence of that in the program itself.

I suspect that *Simple Business Accounts* is an also-ran. I know that sounds harsh, but the market is a harsh one for this software, and I don't think that the program is good enough to be worth buying for any except the very small business person who may want a low-cost introduction to computerised account.

Even then, my advice would be not to throw away the accounts book just yet.

Simon Springett

Warwager

Program *Battle for Midway* **Micro** Commodore 64 **Price** £8.95 **Supplier** Personal Software Services, 452 Stoney Stanton Road, Coventry, CV6 5DG

Midway from PSS is one of the most complicated and difficult computer games I have yet encountered.

It is essentially a sort of graphics plus action adventure game, based on the *Battle of Midway* which took place in the Pacific during World War II.

In the game you are the commander of the American forces protecting Midway, and you have to defend the island against Japanese attack. As in the real battle the Japanese will give up if their four aircraft carriers in one of their fleets are sunk, so in order to win, your main objective is to find and destroy these ships.

All the various forces at the disposal of the Japanese and American commanders are represented in the game, and the Japanese will follow basically the same tactics as in the war. However, this leads to much complexity since the forces are large and varied, and are divided up into many different combat units. The facilities for controlling the forces and for examining their status also take quite a bit of mastering.

The game takes place in real time, and the Japanese attacks are simulated in arcade-style action which is all quite well done.

Richard Corfield

Labyrinth

Program *Rapscallion* **Micro** Spectrum **Price** £6.95 **Supplier** Bug-Byte, Mulberry House, Canning Place, Liverpool.

Rapscallion — the new game from Bug-Byte — has so far received a good deal of pre-publicity and after playing the game I would say that it was all justified.

The game challenges you to move through an arid wilderness, consisting mainly of dungeons of one sort or another, through a labyrinth and into your castle, stolen from you by the dreaded Rapscallion the Rogue.

You have six lives, and two identities: bird and a fly. As bird you are vulnerable to dangers such as cats, whereas as fly you are safe from these, but prey to spiders who don't bother the bird.

There are a very large number of locations, and a good selection of barriers and hinderences to be overcome.

Bug-Byte deserve their good reputation, and this game will enhance it further. Recommended.

Simon Springett

Black blob

Program *Atom Smasher* **Micro** Amstrad CPC64 **Price** £6.99 **Supplier** Romik, 272 Avenue Slough, Berks.

Romik, who seem to believe in quantity rather than quality, have added yet another computer to their catalogue — the Amstrad. This game is a conversion of an old Vic20 game. Sad to say, the game might have been good on the Vic, several years ago, but now on the Amstrad, it looks a bit old hat.

'You' are a 'greater-than' sign, or an arrow-head. You can rotate and move in the same way as in *Asteroids* (remember that?) And, of course, you can fire. When you have shot the black blob, another electron appears, and you have to start again, trying to shoot another black blob. By the time there are four or five electrons flying around the screen this gets quite tricky — you have to keep an eye on all the electrons, at the same time as trying to shoot the blob. I ended up by being very frustrated by this and yet, because the game is so simple, this did not turn into wanting another go. I just remained frustrated.

This might sell, as it is cheaper than Amsoft's close to making use of the Amstard's advanced graphics capabilities.

David Lister

Gold mine

Program *Gilligan's Gold* **Micro** Commodore 64 **Price** £7.95 **Supplier** Ocean Software, Ocean House, 6 Central Street, Manchester 2.

The author of the very popular *Manic Miner* has got a lot to answer for. The number of imitators of that style of game continues to increase. One of the latest in this vein to appear for the Commodore 64, *Gilligan's Gold* from Ocean Software. This follows the standard pattern for this type of game.

You have to guide Gilligan through the mine workings to collect bags of gold and place them in a wheelbarrow. You make your way around the mine via platforms, ladders and lifts, avoiding the outlaws who are out to get you and the gold. You have a limited time in which to collect the bags, but each one you get gives you more time.

This is all very much standard stuff, and the game lacks anything which really distinguishes it from many other similar efforts. Nevertheless, it is quite enjoyable and not badly programmed. However, the graphics and sound are definitely run of the mill.

There are plenty of better versions of the same type of game on the market already, and most of these give more variety and interest than this one.

Richard Corfield

Check list

Program *Physics O-Level Revision* **Price** £8.95 **Supplier** Longman Software, Longman House, Burnt Mill, Harlow, Essex CM20 2JE.

Unfortunately, the subject of this review arrived too late for the market for which it was intended.

Physics O-level Revision from Longman Software is one of those once-a-year things, intended to help students with their revision.

The cassette contains five programs. Four cover some of the major areas of the subject and one acts as a sort of reference index to topics in Physics. This reference program will list out all the topics which are related to a particular area of Physics, so that you can use it as a kind of check-list to ensure that all the relevant items have been revised.

The other four programs cover formulae, circuits, light and mechanics.

This is a well planned package, however, it is very much a nice little extra to the main revision material, which remain as notes and the text book, and is not a substitute for these.

Richard Corfield

Magic potions

Program *Merlin* **Micro** Commodore 64 **Price** £8.95 **Supplier** Wye Valley Software, Parton House, Kinnersley, Herefordshire

Merlin from Wye Valley Software is very much a typical high-speed arcade action type of game, although the setting is a little different.

You take the part of the wizard Merlin, who is being attacked by various evil creatures. You can destroy your opponents by casting spells on them, but your magic energies are limited, and must be restored occasionally by brewing up a magic potion.

To do this you must collect various delightful ingredients like a skull, a frog's leg, an eye and a shimmering crystal. Not surprisingly, the creatures do their best to stop you. When you do manage a successful brew-up, your powers are fully restored and you move on to the next level.

If you stick to the standard arcade-game tactics with this one you won't go far wrong; shoot everything that moves and collect all the bits that don't. Although the principle of the game is not new, it is well presented with nice graphics and sound, and the action is certainly fast. Definitely worth a look if you are an arcade action fan.

Richard Corfield

Flippers

Program Gate Crasher **Micro** Spectrum 48K **Price** £8.95 **Supplier** Quicksilva.

Gate Crasher is a refreshing change from the normal 'shoot-em-up' games on the market, although the idea is still quite simple.

Barrels are released from the top of the screen, and you must manoeuvre an intervening maze to guide them to slots at the bottom. This is further complicated by flippers within the maze which will deflect the barrels making their way down.

The combination of concentration (needed to drop the barrels into the right slots to complete the screen) and pure reaction makes this a challenging and addictive game.

For extra incentive, Quicksilva have put forward a £200 prize for the first person to complete Screen 7. The game is Kempton Joystick compatible, and has user definable keys, which will enable other joysticks to be used.

For those who prefer their arcade games a little different it is definitely recommended.

Philip Martin

Flower-pots

Program *Jump for your Life* **Micro** Spectrum **Price** £5.99 **Supplier** Unique, 16 Thorney Lane, South Iver, Bucks.

Jump For Your Life, says the press release, will have you jumping mad, and there's no denying that this is true.

The tape is an arcade-type game setting you in the role of a climber attempting to scale the outside of a large skyscraper. As usual, I never did discover just what reward there was for reaching the top, but I was able to suffer the various fates in store for the unwary. Rough looking men appear at the windows and push you off the edge, or possibly drop a flower-pot on you.

The game uses sprites well, and though the claim about "smooth-scrolling action" was hardly justified, the game does use colour to good advantage and has music at the beginning that would grace a real arcade game.

As you play, unfortunately, the music has to be left out to allow the Spectrum to cope with the graphics.

This would never be my favourite game. In particular, the keyboard controls are cramped together in one part of the keyboard and seem designed for *ET* to use, rather than a human. My other grouse is that the falling flowerpots are sometimes released so close to you that there is no opportunity to avoid them.

Dedicated arcade fans will probably enjoy this one, but the rest of us may well find it a bore.

Simon Springett

Symbiotic

Program *Rogue Ship* **Price** *£7.95* **Micro** *Spectrum* **Supplier** *Alan Pywell 3 Cleve Avenue Matlock Derbys DE4 3RD*

Praised be the Quill. An outpouring of well-constructed adventures from people who would otherwise not have the programming skills to write them. *Rogue Ship* is a Quilled adventure which will, form the first part of a trilogy called *Earthquest* about the search for the lost planet Earth.

It is different – instead of a help command, you consult Inman a symbiotic being who lives in your body and occasionally makes helpful, unhelpful or irrelevant comments at timely, untimely and irrelevant moments. It's also incredibly devious, much furious note taking and map making is required.

Rogue Ship has much to recommend it – cleverly constructed, apparently lacking in spelling mistakes, witty(ish). I really only have two complaints, firstly why spaceships, lasers, etc, why not make the plot really original, and £7.95 is a bit steep.

Ian Waltham

Into overdrive

***Malcolm Bryant** shows how Spectrum Microdrives can be used with the QL.*

Sinclair claim that the Spectrum Microdrives are not compatible with the QL. This means that you cannot take a cartridge with a Spectrum program and read it into the QL, which is not really surprising.

However, it is possible to connect Spectrum Microdrives directly to the QL and they will then work exactly as if they were additional QL Microdrives.

Proceed as follows: Take your Spectrum Microdrive(s) along with their connecting cable and plug into the QL Microdrive expansion port on the right-hand side of the computer. By putting a single twist in the cable, the Spectrum Microdrive(s) can sit on top of the QL Microdrives. You will now find that these drives can be accessed as MDV3, MDV4 and so on. This can be extremely useful. A practical example of how four drives can be used is while running the Psion packages. The back up commands (eg, *Archive*) are almost worthless with only two drives since a file cannot be copied from MDV2 on to a new cartridge unless it is to MDV1 which is not normally what is required. Now files can be backed up from MDV3 to MDV3 — far more convenient.

A further tip when running *Quill*. To improve the speed of the Microdrive operations keep your document on MDV3 (if you also have MDV4 then put your back-up cartridge in there). The work file *def-doc* will still be written to MDV3 and file reading and writing then be faster, particularly if you can keep a lot of free sectors on MDV2.

Another string . . .

*Use this program by **Richard Snowdon** to edit and write text using Quill*

This program is very useful as it allows you to edit or even write programs using the word processor, *Quill* and then convert the text to a machine readable form so that the edited program can be tested.

The following is a fools guide to using this *Quill* utility:

1) Load program to be edited, eg, load mdv2_invader (if the program is called 'invader')
2) Save this program with the extension '_lis so that it can be loaded into *Quill* eg *save mdv2_invader_lis*
3) Boot *Quill*, eg, lrun mdv1_boot
4) Choose the import option on *Quill* (under 'Files' on the second command screen) to load the program to be edited, eg, *Import, invader_lis* (making sure mvader_lis is on mdv2)
5) When it's loaded, press ESC to leave Files and edit the program using any of the ample features of QUILL.
   I used QUILL with this program to replace short variable names with long meaningful ones and split multi-command lines. It could also be used to move blocks of code to the end of a program and head them as procedures, etc
6) When finished editing use the 'Save' option (on the first command screen) to save the program and then *Quit Quill*
7) Load this utility, and enter the drive number of the program and the name you saved it as and the file name you want the loadable version to be
8) When the utility is finished, you will be able to load the final version of the edited program.

This utility is needed because *Quill* saves text (documents and programs) with excess codes (linefeeds, page markers, margin information) padded around the text. This utility strips all of these characters from the program proper, enabling it to be loaded. I have taken advantage of the fact that *Quill* saves text unjustified. This is the reason it takes such a long time to *Save* and *Load* — when a document is loaded, the characters are read one at a time from a file, and each line has to be justified as it comes. Similarly, *Quill* has to reformat/unjustify text before filing.

As the present generation of mainframe/mini users have found, it is much easier to write and edit programs using a word processor. I hope that with the help of this utility, other QL users will realise this too.

```
100 REMark QUILL utility
110 REMark by Richard Snowdon
120 MODE 4 PAPER 0 STRIP 2
130 DIM text$(1000),search$(1) count=0 memory=0
140 REPeat validate
150  PRINT #0,"Which drive [illegible]":drive$=KEY$(1)
160  IF drive$="1" OR drive$="2" THEN EXIT validate
170 END REPeat validate:PRINT #0 drive$
180 INPUT #0,"What's the name of the Quill file [illegible]";quill$
190 IF LEN(quill$)>3 THEN
200     last$=quill$(LEN(quill$)-3 TO)
210     IF last$<>"_doc" AND last$<>"_DOC" THEN
220        quill$=quill$&"_doc"
230     END IF
240  ELSE quill$=quill$&"_doc"
250 END IF
260 INPUT #0,"What do you want the resulting file to be called [illegible]";final$
270 OPEN #6,"mdv"&drive$&"_"&quill$
280 DELETE "mdv"&drive$&"_"&final$
290 OPEN_NEW #7,"mdv"&drive$&"_"&final$
300 REPeat check
310  first$=KEY$(6)
320  IF CODE(first$)=10 THEN count=count+1
 ELSE count=0
330  IF count=3 THEN count=0:EXIT check
340 END REPeat check
350 REPeat main_loop
360  text$=KEY$(6)
370  asc=CODE(text$)
380  IF asc=0 THEN count=count+1 ELSE count=0
390  IF count=3 THEN EXIT main_loop
400  SELect ON asc
410   =49 TO 57
420    PRINT text$
430    REPeat rest
440     char$=KEY$(6)
450     IF CODE(char$)=0 THEN
460        length=LEN(text$)
470        IF length=1 THEN EXIT rest
480        memory=memory+length
490        PRINT #7,text$:PRINT
500        EXIT rest
510     END IF
520     PRINT char$
530     text$=text$&char$
540    END REPeat rest
550  END SELect
560 END REPeat main_loop
570 CLOSE #6:CLOSE #7
580 PRINT \"Finished     Program length
INT(memory/1024*100)/100   Kb
590 DEFine FuNction KEY$(chan)
RETurn INKEY$(#chan,-1)
```

Putting the record straight

Alan Want presents a relocatable machine code bubble sort routine

A common use for computers is the sorting of lists of data into alphabetical or numeric order. The simplest form of sorting and that most used by home programmers is the 'Bubble Sort'. This is a simple, easy to understand Sort method, but in its Basic form is very slow.

This article gives a machine code bubble sort that is very much faster in operation.

Bubble sorting involves comparing each item in the list with the following item, swopping if that next item is 'smaller'. The checking continues until no more swops are required.

Both the Basic (List 4) and the machine code routines (Lists 1 and 3) presented here work in the same way, taking data in an array *A$(YY,ZZ)* and sorting strings 'ZZ' into ascending order. Both routines use approx 300 bytes, but the Basic version will sort an array *A$(100,1)* in approx 4 min 17 secs and the machine code version sorts the same array in 1.7 Secs.

When comparing with a fast Basic sort (Shell Sort) the times for an array *A$(309,33)* were:-

Basic Bubble — over 1 Hour: Basic Shell — 4 Mins: Machine Code Bubble — 30 Secs.

The machine code sort routine checks the list for the last string used (checks for space in position *A$(YY,1)*), thus ensuring that unused blank strings are not moved ahead of data strings.

The code is relocatable and thus can be run in any area of Ram except the printer buffer (5B00h on) as this area is used with the position in string 'ZZ' from which sorting is to take place, ie, *POKE 23298, 10* will sort by order *A$(XX, 10 TO)*.

The maximum length of 'ZZ' should not exceed 245 bytes. To use routine load data in List 2 into RAM starting at 32000 then Save *"SORT" CODE 32000,262*. The code can then be reloaded into any position by *Load "SORT" CODE XXXXX*. To sort use *RAND USER XXXXX* or *LET X = USR XXXXX*. (See List 3)

List 5 shows the routine put into practical use in arranging an index for magazine articles.

List 1

```
[illegible]
```

List 1 (cont)

```
FAEF 13         1970 COMP2 INC  DE
FAF0 23         1980       INC  HL
FAF1 10F4       1990       DJNZ LOOPC
FAF3 E1         2000 LARGE POP  HL
FAF4 D1         2010       POP  DE
FAF5 19         2020       ADD  HL,DE
FAF6 D5         2030       PUSH DE
FAF7 ED5B0459   2040       LD   DE,(END
FAFB E5         2050       PUSH HL
FAFC 2B         2060       DEC  HL
FAFD A7         2070       AND  A
FAFE ED52       2080       SBC  HL,DE
FB00 E1         2090       POP  HL
FB01 D1         2100       POP  DE
FB02 20C9       2110       JR   NZ,COMP1
FB04 F9         2120       EI
FB05 C9         2130       RET
                2140 FINIS END

FINIS   FB06
LARGE   FAF3
COMP2   FAEF
LOOPC   FAE7
COMP2   FAC0
CHECK   FAC5
END?    FAB8
SWOP    FABD
SMALL   FAD8
LARGE   FAB5
CONT    FA98
LOOPC   FA9E
COMP1   FA7A
SPACE   FA6A
NEPAC   FA5A
SORT    FA3C
TEMP    5B10
REG     5B08
END     5B04
POS     5B03
NO      5B01
LEN     5B00
NEND    FA3C
N+3     FA29
NUMB    FA24
LOOP    FA1E
ADD     FA1D
SEACH   FA02
VARS    5C4B
E       6104
```

List 2

```
XX000   4   75  57  126 204 128 48  48  254 193
XX010   47  30  [illegible] 111 40  25  205 127 48  16
XX020   0   [illegible] 40  6   1   19  [illegible] [illegible] 24  [illegible]
XX030   15  [illegible] [illegible] [illegible] 40  250 1   [illegible] 6   24
XX040   24  [illegible] 5   35  4   [illegible] 24  235 187 1
XX050   24  [illegible] 84  [illegible] [illegible] 229 25  34  4   91
XX060   [illegible] [illegible] [illegible] [illegible] 59  1   91  35  126 56
XX070   [illegible] 91  35  [illegible] 80  0   91  35  35  34
XX080   [illegible] [illegible] [illegible] 0   53  0   31  95  25  229
XX090   [illegible] [illegible] [illegible] 40  15  25  213 237 91  4
XX100   31  [illegible] [illegible] [illegible] [illegible] [illegible] 205 209 3   236
XX110   43  4   [illegible] 71  25  [illegible] [illegible] 98  3   91
XX120   [illegible] 145 [illegible] 6   9   5   84  93  68  0
XX130   [illegible] 24  [illegible] [illegible] [illegible] [illegible] [illegible] 1   121 144
XX140   1   [illegible] [illegible] 40  4   40  8   [illegible] 4   19
XX150   33  [illegible] 244 24  [illegible] [illegible] [illegible] 13  229 66
XX160   [illegible] 76  [illegible] [illegible] [illegible] 19  [illegible] 16  31  237
XX170   [illegible] 15  [illegible] 167 [illegible] [illegible] 153 33  16  91
XX180   [illegible] [illegible] [illegible] 176 [illegible] [illegible] [illegible] [illegible] [illegible] 91
XX190   [illegible] [illegible] 225 42  [illegible] [illegible] 82  [illegible] 209 32
XX200   [illegible] 47  [illegible] 91  [illegible] 13  [illegible] 38  [illegible] 91
XX210   [illegible] 145 9   [illegible] 3   9   84  [illegible] 58  9
XX220   1   [illegible] [illegible] [illegible] [illegible] [illegible] 141 71  [illegible] 144
XX230   1   [illegible] 190 44  4   [illegible] [illegible] 24  [illegible] 19
XX240   5   [illegible] [illegible] [illegible] 205 [illegible] 21  [illegible] 91  [illegible]
XX250   [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] 209 32  201
XX260   [illegible] 01  [illegible]
```

[illegible] machine code version [illegible]

List 3

```
[illegible] BUBBLE SORT - MACHINE CODE - BASIC DRIVER
[illegible]
[illegible] REM [illegible] array A$ [illegible] ascending order
[illegible] REM Cont from List [illegible] to [illegible] 32000
[illegible] REM [illegible]
[illegible] REM [illegible] string [illegible] to Sort [illegible]
[illegible] position
[illegible] RANDOMIZE USR 32000
```

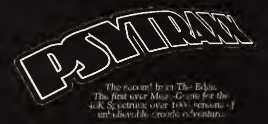
List 3

List 4

```
[illegible] SORT BASIC VERSION
[illegible]
[illegible] IF [illegible] TO [illegible] THEN LET [illegible]
LET [illegible]
[illegible] LET [illegible] IF [illegible] THEN GO TO 1020
[illegible] LET [illegible]
[illegible] IF [illegible] TO [illegible] THEN GO TO 1020
[illegible] LET [illegible] IF [illegible] THEN GO TO 1050
```

List 5

```
10 REM SAMPLE PROGRAM USING 1000 ROUTINE
20 REM ARRANGES INDEX OF ARTICLES
30 REM SET [illegible] TO MAX [illegible] REQUIRED
40 REM TO START [illegible] THEN IF BREAK USE GOTO 1000
50 REM [illegible] ROUTINE LOADED BEFORE FIRST RUN
60 REM [illegible] 1984
1000 CLS : PRINT [illegible] MAGAZINE INDEX
1010 PRINT [illegible] 1 Data Information 2 List by article 3 List by Issue 4 List by Page 5 Save
1020 PRINT [illegible] INKEY$ [illegible] Select Option
1030 LET [illegible] THEN GO TO 1000
1040 IF [illegible] THEN GO TO 2000
1050 IF [illegible] THEN GO TO 3000
1060 IF [illegible] THEN GO TO 4000
1070 IF [illegible] THEN GO TO 5000
1080 IF [illegible] THEN GO TO 6000
1090 GO TO [illegible]
2000 REM [illegible] ENTRY
2010 CLS
2020 IF [illegible] THEN PRINT [illegible] : PAUSE [illegible] GO TO Menu
2030 PRINT [illegible] INPUT " Article" [illegible] letters [illegible]
2040 LET [illegible] PRINT [illegible]
2050 INPUT [illegible] Issue [illegible] letters [illegible]
2060 LET [illegible] PRINT [illegible]
2070 INPUT "Page" [illegible] letters [illegible]
2080 LET [illegible] PRINT [illegible]
2090 INPUT [illegible] Another Article [illegible] THEN LET [illegible] GO TO [illegible]
2100 LET [illegible] GO TO Menu
3000 POKE 23299 [illegible] RANDOMIZE USR 64000: GO TO Print
4000 POKE 23299 [illegible] RANDOMIZE USR 64000: GO TO Print
5000 POKE 23299 [illegible] RANDOMIZE USR 64000: GO TO Print
6000 [illegible] INPUT [illegible] SAVE [illegible] SAVE [illegible] GO TO Menu
6100 PRINT [illegible] LOAD [illegible] GO TO Menu
7000 REM Print List
7010 [illegible] INPUT [illegible] screen [illegible] or Printer [illegible]
7020 LET [illegible]
7100 FOR [illegible] STEP 20
7105 CLS : FOR [illegible] IF [illegible] THEN GO TO 7160
7150 [illegible]
7160 IF [illegible] THEN [illegible] GO TO Menu
7190 PRINT [illegible] INKEY$ [illegible] Next Page [illegible] Menu [illegible] Page
7195 POKE [illegible] LET [illegible]
7200 IF [illegible] THEN GO TO Menu
7190 IF [illegible] THEN [illegible]
7200 IF [illegible] THEN LET [illegible] IF [illegible] THEN LET [illegible]
7205 IF [illegible] THEN GO TO 7140
7210 GO TO 7075
8000 CLEAR 63999
9000 LET [illegible]
9010 LET [illegible] GO TO Menu
```


PSYTRAXX
The second from The Edge.
The first ever Mega-Game for the
48K Spectrum; over 1000 screens of
unbelievable arcade adventure.

EDGE

Design of the times

***Thomas Ellenrieder's** program enables you to create sophisticated graphics*

With this program, complex graphics can be created on the Commodore 64 very easily. It has many advanced features, such as different paint brushes and the ability to draw circles, eclipses and rectangles. It is also possible to paint specific areas and to dump the screen to a printer.

Program notes

30-180	command table
200-260	sets up sprite
300-600	main program
600-1160	interprets commands
1600-1660	eclipse
1700-1730	save

Variables

x,y	position of joy stick
ps	paint, move, erase
pb	paint brush
d	value from joystick
s	move fast/slow
1	normal brush
2	thick brush
3	fountain brush
4	spray brush
f1	move brush
f2	paint brush
f3	erase brush

- *l* draws a line between cursor position and *n*
- *c* circle, *n* defines centre; distance between *n* and cursor defines radius
- *e* draws an eclipse, cursor defines centre
- *r* draws a rectangle; *n* defines top right hand corner, cursor or bottom left
- ← give menu
- *f* fills an area, cursor in area to be filled
- ↑ new screen
- *p* dump to printer

Define position of *n* by pressing *n* at appropriate cursor position.

```
10 REM ARK COMPLEX DRAWING PROGRAM!!
20 REM ARK T ELLENRIEDER 1984
25 GOTO 300
30 REMARK COMMAND TABLE
40 RLOCMOB 2,0,0,0,1' CSET0:PRINT"
  COMMAND TABLE
50 PRINT Q  [F1] MOVE
60 PRINT Q  [F2] DRAW
70 PRINT Q  [F3] RUB
80 PRINT QQ  [1] PEN (NORMAL)
90 PRINT Q  [2] PEN (THICK)
100 PRINT Q  [3] PEN (FOUNTAIN)
110 PRINT"Q  [4] PEN (SPRAY PAINT)
120 PRINT QQ  [L] LINE (P.DEF N)
130 PRINT    [C] CIRCLE (P DEF N)
140 PRINT    [R] RECTANGLE (P.DEF N)
150 PRINT    [F] FILL (P DEF N)
160 PRINT    [E] EQLIPSE (P.DEF N)
170 PRINT    [D] DUMP TO CN2
175 GET D$:IF D$=""THEN 175
176 CSET2 MMOB0,0,0,X,Y,0,1
180 GOTO 300
200 REMARK SPRITE SET-UP
210 HIRES0,1 DESIGN 0,832+49152
220 @BBBBBBBBBBBBBBBBBBBBBBBB..
221 @BB        B          BB..
222 @B B ....B  .. B.B
223 @B.     .  . .. ....B...
224 @B . B    B    .B.  B..
225 @B  .B   B,   .B,   B,..
226 @B          . ... .B...
227 @B    .B  B, B,... .B...
228 @B    ..B.B B.   .  B..
229 @B.. .  .  .  ...   B...
230 @BBB BB BB   BB BB.BB.BB.
231 @B            .    B..
232 @B      .B.B.B       B.
233 @B      B  B  B      B.
234 @B          .  ..    B..
235 @B.   B.   B.   .B.. .B...
236 @B   B .. .B.   ..B. .B...
237 @B           .... . B...
238 @B B .   .B . . .B.B..
239 @BB  ..    B.       BB...
240 @BBBBBBBBBBBBBBBBBBBBBBBB
250 MOB SET 0,13,0,0,0
260 RETURN
300 REM*****************
301 REM*CP MAIN PROGRAM*
302 REM*****************
320 PRINT
330 PRINT QQQ     JOYSTICK IN #2
340 FOR N=1TO700:NEXT N
350 PRINT
355 GOSUB 200
360 PRINT
370 X=160:Y=100:Z=1:PS=1
380 D=JOY
390 GET A$:IF NOT A$=""THEN 1000
395 IF D>127 THEN  D=D-128:Z=3
400 IF D=1 THEN Y=Y-Z
410 IF D=2 THEN Y=Y-Z:X=X+Z
420 IF D=3 THEN X=X+Z
430 IF D=4 THEN Y=Y+Z:X=X+Z
440 IF D=5 THEN Y=Y+Z
450 IF D=6 THEN X=X-Z:Y=Y+Z
460 IF D=7 THEN X=X-Z
470 IF D=8 THEN X=X-Z:Y=Y-Z
480 Z=1
500 RLOCMOB 0,X+14,Y+40,0,2
505 IF PS=1THEN 600
510 IF PB=1 THEN PLOTX,Y,PS
520 IF PB=2 THEN PLOTX-1,Y,PS:PLOTX+1,Y,
PS:PLOTX-1,Y-1,PS:PLOTX,Y-1,PS
530 IF PB=2 THEN PLOTX+1,Y-1,PS:PLOTX-1,
Y+1,PS:PLOTX,Y+1,PS:PLOTX+1,Y+1,PS
540 IF PB=3 THEN PLOTX,Y,PS:PLOTX,Y-1,PS
:PLOTX,Y+1,PS
550 IF PB=4THEN I=INT(RND(1)*6)-3:O=INT(
RND(1)*6)-3
560 IF PB=4 THEN PLOTX-I,Y-O,1:PLOTX-O,Y
-I,1
600 GOTO 380
1000 IF A$="←"THEN GOSUB 30
1010 IF A$="N"THEN X1=X:Y1=Y
1030 IF A$="L"THEN LINE X1,Y1,X,Y,PS
1040 IFA$="C"THENA=ABS(X1-X):B=ABS(Y1-Y)
:Q=A↑2+B↑2:C=SQR(Q):CIRCLEX1,Y1,C,C,PS
1050 IF A$="R"THEN RECX1,Y1,X-X1,Y-Y1,1
1060 IF A$="F"THEN PAINTX,Y,1
1070 IF A$="E"THEN 1600
1080 IF A$="D"THEN 1700
1090 IF A$="1"THEN PB=1
1100 IF A$="2"THEN PB=2
1110 IF A$="3"THEN PB=3
1120 IF A$="4"THEN PB=4
1125 REMARK PAINT-MOVE-DELETE
1130 IF A$="" THEN PS=-1
1140 IF A$="" THEN PS=1
1150 IF A$="" THEN PS=0
1155 IF A$="↑"THEN GOSUB 200
1160 GOTO 380
1600 REMARK EQLIPSE
1610 CSET0:PRINT
1620 PRINT QQQ  EQLIPSE
1630 INPUT "X-RADIUS";RX
1640 INPUT "Y-RADIUS";RY
1650 CIRCLE X1,Y1,RX,RY,PS
1660 CSET2:GOTO 1160
1700 REMARK DUMP TO PRINTER
1710 PRINT"
1730 COPY
1740 GOTO 1160
READY.
```

A Fair Deal For Our Advertisers

No guesses, no wishful thinking – the circulation of this magazine is audited to the strict professional standards administered by the Audit Bureau of Circulations



The Hallmark of Audited Circulation

A masterpiece

Michael Griffin concludes Computer Art, a sophisticated graphics program

Computer Art allows you to create complicated pictures on screen using a simple single-key system of instructions and either a joystick or the cursor keys.

The first part of *Computer Art's* commands were published last week; the remainder follow.

Select joystick/cursor key *cross control.* Accessed by pressing the *Tab* key. The control is switched between the two and the function is accompanied by a warning bleep.

Draw arc. Accessed by pressing the *Ctrl* key. This is identical to *Elipse* except only an arc is drawn.

Set Point2. Accessed by pressing the *Return* key. This sets the value of a point called *Point2* to be the same as the current *cross* position.

Erase. Accessed by pressing the *Delete* key. This wipes out a triangular area to the current background colour (black). The verteces (corners) of this triangle are the current cross position, *Point* and *Point2*.

Light dotted area fill. Accessed by pressing the '1' key. This fills an area enclosed by a perimeter with spaced dots — the fill routine is non-recursive, but if it escapes the routine can be aborted by pressing the *Escape* key.

Striped area fill. Accessed by pressing the '2' key. Same as above except it fills an area with stripes.

Heavy dotted area fill. Accessed by pressing the '3' key. Same as above except it fills an area with a checker-board fill.

Solid area fill. Accessed by pressing the '4' key. Same as above except it fills an area with solid black.

Reference grid. Accessed by pressing the '6' key. Plots a fine grid of dots on the screen to assist with accurate scale drawing.

Remove grid. Accessed by pressing the '7' key. Removes the reference grid.

Display screen co-ordinates. Accessed by pressing the *Shift* key. This displays the present screen co-ordinates of *Point* (as *V* and *W*) and the present screen co-ordinates of the cross (as *X* and *Y*).

Escape fill or print-out. Accessed by pressing the *Escape* key. Aborts fill routine or printer dump.

Load screen image, Save screen image, Dump screen to printer, Clear screen and *Key summary.* All accessed by pressing *Copy* key and then pressing the appropriate number of the options displayed. Any other key returns to normal operation.

The program *Loads and Saves* screen images as the name 'Picture'. It will automatically overwrite old images and any *other programs of the same name.* It is therefore wise to check beforehand for any possible name clashes before use, and any images you wish to keep must be *Renamed for their own protection.

Note: For some strange reason my printer has put £ signs instead of # signs between lines 1640 and 1970. Wherever the £ sign is printed it should be replaced with a #.

```
1270DEFPROCCHOICE
1280 PROCREMOVEGRID
1290 PROCCROSS
1300GCOL3,3
1310 VDU19,1,7,0,0,0:19,3,0,0,0,0
1320VDU5 MOVE0 1000 PRINT"1 - SAVE PICTURE"'"3 - LOAD PICTURE "'"5 - PRINT PICTU
RE"'"7 - CLEAR SCREEN" "9 - HELP MENU"'"ANY OTHER KEY ABORTS"
1330 *FX15
1340 A$=GET$
1350 VDU19 1 2 0,0,0 :19,2,2,0,0,0
1360MOVE0 1000 PRINT"1 - SAVE PICTURE"'"3 - LOAD PICTURE "'"5 - PRINT PICTURE" "
7 - CLEAR SCREEN" "9 - HELP MENU"'"ANY OTHER KEY ABORTS"
1370 IF A$="5" PROCDUMP
1380 IF A$="1" PROCSAVE
1390 IF A$="3" PROCLOAD
1400 IF A$="7" CLS
1410 IF A$="9" PROCKEYS
1420 PROCCROSS
1430 ENDPROC
1440 DEFPROCSAVE
1450 *SAVE PICTURE 3000 7FFF
1460 ENDPROC
1470 DEFPROCLOAD
1480 *LOAD PICTURE 3000
1490 ENDPROC
1500 DEFPROCASSEMBLE
1510 OSWORD=&FFF1
1520 OSWRCH=&FFEE
1530DIM S% 80
1540XLO=S%
1550XHI=S%+1
1560YLO=S%+2
1570YHI=S%+3
1580 value=S%+4
1590BYTE=S%+5
1600COUNT7=S%+6
1610DX=S%+7
1620 FOR opt=0TO2STEP2
1630P%=S%
1640[OPT opt
1650.POINT LDA £9
1660LDX £XLO MOD 256
1670LDY £XLO DIV 256
1680JSR OSWORD
1690RTS
1700.printchar LDA £1
1710JSR OSWRCH
1720LDA BYTE
1730JSR OSWRCH
1740RTS
1750 INCY CLC
1760LDA YLO
1770ADC £4
1780STA YLO
1790BCS INC_YHI
1800RTS
1810 INC_YHI INC YHI
1820RTS
1830.one_byte LDA £1
1840STA BYTE
1850 LOOP ASL BYTE
1860JSR POINT
1870LDA value
1880BEQ GO_ON
1890CMP £&FF
1900BEQ GO_ON
1910INC BYTE
1920.GO_ON JSR INCY
1930DEC COUNT7
1940BNE LOOP
1950JSR printchar
1960RTS
1970]
1980NEXT
1990ENDPROC
2000 DEFPROCKEYS
2010 GCOL2,3
2020 VDU19,1,7,0,0,0,19,3,0,0,0,0
2030 VDU5
2040 MOVE 0 1023:PROCFUNCTIONS
2050 *FX15
2060 A$=GET$
2070 VDU19 1,3 0 0 0,19 2,2 0,0 0
2080 MOVE 0,1023 PROCFUNCTIONS
2090 VDU4
2100 ENDPROC
2110 DEFPROCFUNCTIONS
2120 PRINT"KEY FUNCTION SUMMARY ON PRESSING [COPY]"'
2130 PRINT"'6'-Plots a Grid for reference"
2140 PRINT" 7 -Removes reference Grid"
2150 PRINT"(F0)-Rubber band      (F1)-Move Point"
2160 PRINT"(F2)-Vertical LN      (F3)-Horizontal LN"
2170 PRINT"(F4)-Draw line        (F5)-Draw and move"
2180 PRINT"(F6)-Rectangle        (F7)-Elipse"
2190 PRINT"(F8)-Place text       (F9)-Air brush"
2200 PRINT"[CTRL]-Joystick/cursor key control toggle
```

continued over the page

```
2210 PRINT"[TAB]-Draws arc from cross to Point"
2220 PRINT"[RETURN]-Gets Point2"
2230 PRINT"[DELETE]-Wipes out area cross P nt-P nt2"
2240 PRINT" 1 -Light dotted area fill"
2250 PRINT" 2 -Striped area fill"
2260 PRINT" 3 -Heavy dotted area fill"
2270 PRINT" 4 -Solid area fill""
2280 PRINT"[SHIFT]-Displays cross and Point coords"
2290 PRINT"[COPY]-Load save Print wipe help menu"
2300 PRINT"[ESCAPE]-Aborts fill and Printout"
2310 PRINT"Printer dump Produced in a 5x25 box on the
seikosa Printer."
2320 PRINT"Disc files of the screen are saved and  loaded
as the file  PICTURE
2330 ENDPROC
2340 DEFPROCFILL
2350 PROCCROSS
2360 GCOL0,2
2370 E%=X% F%=Y%
2380 REPEAT PROCLINEFILL F%=F%+4 UNTIL POINT(E%,F%)<>0
2390 E%=X% F%=Y%-4
2400 REPEAT PROCLINEFILL F%=F%-4 UNTIL POINT(E% F%)<>0
2410 PROCCROSS
2420 ENDPROC
2430 DEFPROCLINEFILL
2440 G%=E%
2450 REPEAT G%=G%-4 UNTIL POINT(G%,F%)<>0
2460 H%=G%
2470 G%=E%
2480 REPEAT G%=G%+4 UNTIL POINT(G%,F%)<>0
2490 IF H%DIV4MOD2=1 H%=H%+4
2500 E%=H%+(G%-H%)/2
2510 IF J%=1 MOVE H% F% PLOT21 G% F% ENDPROC
2520 IF J%=0 AND F%DIV4MOD2=1 THEN ENDPROC
2530 IF J%=3 MOVEH% F% DRAWG%,F% ENDPROC
2540 IF F%DIV4MOD2=1 MOVEH%+4 F% ELSE MOVE H%,F%
2550 PLOT21 G% F%
2560 ENDPROC
2570 DEFPROCARC
2580 PROCCROSS
2590 GCOL0,2
2600 MOVE X% Y%
2610 FORA=0TO1.59STEP0.05 DRAW V +SIN(A)*(X%-V%),
W +COS(A)*(Y%-W%) NEXT
2620 DRAW X% W%
2630 PROCCROSS
2640 ENDPROC
2650 DEFPROCGRID
2660 PROCCROSS
2670 GCOL1 1
2680 FORF%=0TO1023STEP16 FORG%=0TO1280STEP16 PLOT69 G%,
F% NEXT NEXT
2690 PROCCROSS
2700 ENDPROC
2710 DEFPROCREMOVEGRID
2720 PROCCROSS
2730 GCOL2 2
2740 MOVE0 1023 MOVE0 0
2750 PLOT85 1279 1023 PLOT85 1279,0
2760 PROCCROSS
2770 ENDPROC
```




CURRAH µSPEECH
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ZX Spectrum sound through your TV speaker. There
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Sound advice

Colin O'Neill explores the possibilities of sound on the new Amstrad CPC 464 micro

The program is a utility which enables the user to explore the complex sound possibilities of the Amstrad. The program is designed to be used in conjunction with the manual, and the variable names used in chapter 6 of the manual have been used as far as possible.

However, as the volume envelope parameters are so extensive, the numeric keypad keys 1-9 have been used. The top row controls the first three parameters, the second row the following three, and the third row the third set. The two remaining volume envelope sections are unused, but could easily be added if required. Please note that use of the volume envelope will automatically change the duration of the note.

The envelope controls have been kept as simple as possible, entry of the first section of the envelope will automatically set the second as a reverse of the first, the final three sections are unused but could be added if required.

To change the parameters, hold down the required key and the up or down arrow key to increase or decrease the values. The note will sound during this procedure so the effect of the change can be monitored. The values of the parameters will be displayed on the screen simultaneously; these can be written down when an interesting sound is generated for subsequent use in other programs.

The program makes use of some of the interesting features of Amstrad's Basic, such as windows and *While/Wend* loops.

```
10 REM ***********************************
**************************
20 REM ****** SOUND EXPERIMENT PROGRAM
FOR AMSTRAD CPC464 ******
30 REM ****** (c) COLIN J. O'NEILL  AUG
UST 1984 ****************
40 REM ***********************************
****************************
50 '
60 a$=" ghijk mluw789456123"
70 MODE 1:BORDER 1:INK 0,13:INK 1,0
80 LOCATE #0,8,22:PRINT#0, SOUND EXPERIM
ENT PROGRAM
90 LOCATE #0,8,24:PRINT#0,"(c) Colin J.
O'Neill 1984"
100 '
110 s=1:h=200:j=2:l=10
 **** SET UP INIT PARAMETERS
120 '
130 REM ********** SET UP WINDOWS *****
*******
140 '
150 WINDOW #1,1,23,1,8:PEN #1,0:PAPER #1
,1:CLS #1
160 WINDOW #2,22,40,1,8:PEN#2,1:PAPER #2
,2:CLS#2
170 WINDOW #3,10,30,10,13:PEN #3,2:PAPER
 #3,3:CLS #3
180 WINDOW #4,1,40,15,19:PAPER #4,1:PEN
#4,2:CLS #4
190 '
200 REM ************* PRINT MENU *****
*********
210 '
220 GOSUB 1230:GOSUB 1350:GOSUB 1420:GOS
UB 1880
230
240 REM ************ WAIT FOR KEYPRESS
*************
250
260 WHILE a$<>"x"
270 WHILE a$=""
280 a$=INKEY$
290 a$=LOWER$(a$)
300 WEND
310
320 REM ************** BRANCH TO SUBROUT
INE **********
330 ON INSTR(a$,a$) GOSUB 1550,400,490,5
70,650,730,790,860,940,1030,1120,1690,1
60,1870,1960,2050,2140,2230,2320,2410
340 IF a$<>"x" THEN a$=""
350 WEND
360 '
370 REM ************** PROGRAM END ***
**************
380 CLS:END
390 '
400 WHILE INKEY(52)=0:'
          **** SOUND CHANNELS
410 IF INKEY(0)=0 THEN s=s+1
420 IF INKEY(2)=0 THEN s=s-1
430 IF s<1 THEN s=4
440 IF s>4 THEN s=1
450 GOSUB 1230
460 WEND
470 RETURN
480
490 WHILE INKEY(44)=0:IF INKEY(0)=0 THE
N h=h+10:'**** TONE PERIOD
500 IF INKEY(2)=0 THEN h=h-10
510 IF h<0 THEN h=4095
520 IF h>4095 THEN h=0
530 GOSUB 1230
540 WEND
550 RETURN
560
570 WHILE INKEY(35)=0:IF INKEY(0)=0 THE
N l=l+1:' **** DURATION
580 IF INKEY(2)=0 THEN l=l-1
590 IF l<-32768 THEN l=32767
600 IF l>32767 THEN l=-32768
610 GOSUB 1230
620 WEND
630 RETURN
640 '
650 WHILE INKEY(45)=0:IF INKEY(0)=0 THE
N j=j+1:' **** VOLUME
660 IF INKEY(2)=0 THEN j=j-1
670 IF j<0 THEN j=15
680 IF j>15 THEN j=0
690 GOSUB 1230
700 WEND
710 RETURN
720 '
730 WHILE INKEY(37)=0:IF INKEY(0)=0 THEN
 k=k+1:'   **** VOLUME ENVELOPE
740 IF INKEY(2)=0 THEN k=k-1
750 GOSUB 1230
760 WEND
770 RETURN
780 '
790 WHILE INKEY(36)=0:IF INKEY(0)=0 THEN
 t=t+1:'    **** TONE ENVELOPE
800 IF INKEY(2)=0 THEN t=t-1
810 GOSUB 1500
820 GOSUB 1230
830 WEND
840 RETURN
850 '
860 WHILE INKEY(38)=0:IF INKEY(0)=0 THEN
 n=n+1:'   **** NOISE
870 IF INKEY(2)=0 THEN n=n-1
880 IF n<0 THEN n=15
890 IF n>15 THEN n=0
900 GOSUB 1230
910 WEND
920 RETURN
930 '
940 WHILE INKEY(51)=0:IF INKEY(0)=0 THEN
 t=t+1:'  **** ENT STEP COUNT
950 IF INKEY(2)=0 THEN t=t-1
960 IF t<0 THEN t=239
970 IF t>239 THEN t=0:CLS#2
980 GOSUB 1500
990 GOSUB 1350
1000 WEND
1010 RETURN
1020
1030 WHILE INKEY(55)=0:IF INKEY(0)=0 THE
N u=u+1:'  **** ENT STEP SIZE
1040 IF INKEY(2)=0 THEN u=u-1
1050 IF u<-128 THEN u=127
1060 IF u>127 THEN u=-128
1070 GOSUB 1500
1080 GOSUB 1350
1090 WEND
1100 RETURN
```

continued over the page

```
1110 '
1120 WHILE INKEY(53)=0 [illegible] INKEY(0)=0 THE
N w=w+1 ' **** ENT PAUSE TIME
1130 IF INKEY(2)=0 THEN w=w-1
1140 IF w<0 THEN w=255
1150 IF w>255 THEN w=0
1160 GOSUB 580
1170 GOSUB 1350
1180 WEND
1190 RETURN
1200 '
1210 REM **************** PRINT SOUND PA
RAMETERS ****************
1220 '
1230 LOCATE #1,1,1:PRINT#1," SOUND - ":PRI
NT#1," C Channel   c"
1240 PRINT#1," H  Tone       h"
1250 PRINT#1," I  Duration   i"
1260 PRINT#1," J  Volume     j"
1270 PRINT#1," K  Vol env    k"
1280 PRINT#1," L  Tone env   l"
1290 PRINT#1," M  Noise      m"
1300 GOSUB 1350
1310 RETURN
1320 '
1330 REM **************** PRINT ENT PARA
METERS ****************
1340 '
1350 LOCATE #2,1,1:PRINT#2," TONE ENVELOP
E "
1360 PRINT#2," T1  Step count  t"
1370 PRINT#2," U1  Step size   u"
1380 PRINT#2," W1  Pause time  w"
1390 PRINT#2," T2  Step count  t"
1400 PRINT#2," U2  Step size   u"
1410 PRINT#2," W2  Pause time  w"
1420 GOSUB 1550
1430 RETURN
1440 '
1450 REM ****************** PRINT KEYBOARD
INS ******************
1460 '
1470 PRINT#3," <SPACE> - Sound note"
1480 PRINT#3," < E >    - End"
1490 PRINT#3,"< "CHR$(240)" >   - Increa
se"
1500 PRINT#3," < "CHR$(241)" >   - Decrea
se"
1510 RETURN
1520 '
1530 REM **********THE LINE THAT SOUNDS
THE NOTE***************
1540 '
1550 SOUND [illegible]
1560 RETURN
1570 '
1580 ENT -1,[illegible]:RETURN
1590 '
1600 REM ******** PRINT VOLUME ENVELOPE
CONTROLS *********
1610 '
1620 LOCATE #4,1,1:PRINT#4," VOLUME ENVEL
OPE"
1630 LOCATE #4,1,2:PRINT#4,"Now move 1-9
control the 1st 3 params"
1640 GOSUB 2520
1650 RETURN
1660 '
1670 REM ******** ENV CONTROLS FOLLOW **
************************
1680 '
1690 WHILE INKEY(10)=0
1700 IF INKEY(0)=0 THEN p1=p1+1
1710 IF INKEY(2)=0 THEN p1=p1-1
1720 IF p1<0 THEN p1=127
1730 IF p1>127 THEN p1=0
1740 GOSUB 2520:GOSUB 2550
1750 WEND
1760 RETURN
1770 '
1780 WHILE INKEY(11)=0
1790 IF INKEY(0)=0 THEN q1=q1+1
1800 IF INKEY(2)=0 THEN q1=q1-1
1810 IF q1<-128 THEN q1=127
1820 IF q1>127 THEN q1=-128
1830 GOSUB 2520:GOSUB 2550
1840 WEND
1850 RETURN
1860 '
1870 WHILE INKEY(3)=0
1880 IF INKEY(0)=0 THEN r1=r1+1
1890 IF INKEY(2)=0 THEN r1=r1-1
1900 IF r1<0 THEN r1=255
1910 IF r1>255 THEN r1=0
1920 GOSUB 2520:GOSUB 2550
1930 WEND
1940 RETURN
1950 '
1960 WHILE INKEY(20)=0
1970 IF INKEY(0)=0 THEN p2=p2+1
1980 IF INKEY(2)=0 THEN p2=p2-1
1990 IF p2<0 THEN p2=127
2000 IF p2>127 THEN p2=0
2010 GOSUB 2520:GOSUB 2550
2020 WEND
2030 RETURN
2040 '
2050 WHILE INKEY(12)=0
2060 IF INKEY(0)=0 THEN q2=q2+1
2070 IF INKEY(2)=0 THEN q2=q2-1
2080 IF q2<-128 THEN q2=127
2090 IF q2>127 THEN q2=-128
2100 GOSUB 2520:GOSUB 2550
2110 WEND
2120 RETURN
2130 '
2140 WHILE INKEY(4)=0
2150 IF INKEY(0)=0 THEN r2=r2+1
2160 IF INKEY(2)=0 THEN r2=r2-1
2170 IF r2<0 THEN r2=255
2180 IF r2>255 THEN r2=0
2190 GOSUB 2520:GOSUB 2550
2200 WEND
2210 RETURN
2220 '
2230 WHILE INKEY(13)=0
2240 IF INKEY(0)=0 THEN p3=p3+1
2250 IF INKEY(2)=0 THEN p3=p3-1
2260 IF p3<0 THEN p3=127
2270 IF p3>127 THEN p3=0
2280 GOSUB 2520:GOSUB 2550
2290 WEND
2300 RETURN
2310 '
2320 WHILE INKEY(14)=0
2330 IF INKEY(0)=0 THEN q3=q3+1
2340 IF INKEY(2)=0 THEN q3=q3-1
2350 IF q3<-128 THEN q3=127
2360 IF q3>127 THEN q3=-128
2370 GOSUB 2520:GOSUB 2550
2380 WEND
2390 RETURN
2400 '
2410 WHILE INKEY(5)=0
2420 IF INKEY(0)=0 THEN r3=r3+1
2430 IF INKEY(2)=0 THEN r3=r3-1
2440 IF r3<0 THEN r3=255
2450 IF r3>255 THEN r3=0
2460 GOSUB 2520:GOSUB 2550
2470 WEND
2480 RETURN
2490 '
2500 REM ************ PRINT ENV PARAMETE
RS ************************
2510 '
2520 LOCATE #4,1,3:PRINT#4,"P1 ";p1;" Q1 "
;q1;" R1 ";r1:PRINT#4,"P2 ";p2;" Q2 ";q2;" R2 ";
r2
2530 PRINT#4,"P3 ";p3;" Q3 ";q3;" R3 ";r3
2540 RETURN
2550 ENV 1,p1,q1,r1,p2,q2,r2,p3,q3,r3:N
=p1*r1+p2*r2+p3*r3
2560 GOSUB 1110
2570 RETURN
2580 '
```

Open Forum

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed.

3-D Graphics

on Spectrum

This program demonstrates very well the powerful *Draw* command. Normally it just draws a line between the current position and the two parameters specified, however if you add a third parameter you can specify the degree of curvature of the line.

The program asks you to input the X,Y coordinates of the centre of the sphere, and then the radius, (make sure it will fit on the screen.) The resolution is a measure of the number of steps when drawing the sphere, 4 gives a fairly low resolution whilst 16 or 32 give a nice high resolution effect.

Program notes

Line 30 Set up screen colour (chosen to character at the moment)
Line 30-60 Input data as described above
Line 1000- Actual routine, may be compacted down to 1 line if to be used in another program

Variables

c Degree of curvature on chosen line
mx,my Centre of sphere
Rad Radius of sphere

```
  10 REM '3D' image of a sphere
  19
  30 BORDER 2. PAPER 4  INK 2. C
LS
  40 INPUT "enter centre coordin
ates,x y ,mx,  and ",my
  50 INPUT "enter radius of sphe
re ",rad
  60 INPUT "enter resolution  PI
/",res  LET res=PI/res
  70 GO SUB 1000
  75 STOP
  80 GO TO 40
 999
1000 REM draw circle
1009
1010 FOR c=-PI TO PI STEP res
1020  PLOT mx-rad,my
1030  DRAW 2*rad,0,c
1040  PLOT mx,my+rad
1050  DRAW 0,-2*rad,c
1060 NEXT c
1069
1070 RETURN
```

3-D Graphics
by Chris Davison

Microradio

GW6JJN

User groups

This week Microradio turns the spotlight on the two radio computing users groups, the Sinclair Amateur Radio Users Group (SARUG) and the user group for people with non-Sinclair computers, RAMTOP.

Both amateur radio and CB are hobbies in their own right and both pastimes have many thousands of followers. Amateur radio for example has been in existence for as long as radio transmissions have been possible. Although it is a technical hobby, the majority of amateurs are non-technical and find radio a welcome change to their normal occupations.

As technology advanced and became inherently more complex, many found it difficult to begin to understand what happened inside the black box of transceivers available today. This is a pity because the tradition of amateur radio is involvement in the technology at whatever level, hopefully even the building of equipment. Microelectronics seemed to have put an end to that involvement for many people. Then something wonderful happened — the home computer.

The micro made it possible for amateurs to transmit data, TV, Morse, RTTY and many other things, and more exciting still, led to involvement and programming. Simple interfaces are possible and the sense of real achievement has returned.

Radio computing as a hobby is with us in a big way as the response to Microradio has shown and to cope with this hobby, user groups were formed. The first is the Sinclair group, SARUG of 3 Red House Lane, Leiston, Suffolk. (Please send an SAE if contacting User Groups.)

Behind SARUG is Paul Newman, G4INP. Paul publishes an excellent newsletter containing projects and programs every couple of months and it is something I wouldn't miss.

Paul is an extremely competent programmer who often assists group members with difficulties as well as publishing his programs along with members with difficulties as well as publishing his programs along with members contributions in the newsletter.

At the moment I am building an interface for RTTY which was published in the SARUG newsheet. Members of SARUG hail from all over the world so the input is terrific. If you have a Sinclair computer and an interest in communicating then get in touch with SARUG.

RAMTOP, the group for non Sinclair machines, is at Great Billing Rectory, Great Billing, Northampton. Run by the Rev Richard Butcher, RAMTOP is younger than SARUG and has also a first newsletter including projects and programs. In the latest RAMTOP newsletter is news of a Beeb Packet Radio System, so hurry.

Please mention *Microradio* if you contact User Group and please, don't forget the SAE.

Ray Berry GW6JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share or topics that you would like to see covered write to Ray Berry, Microradio, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

Moles

on Vic20

This program is also written for the unexpanded Vic20 or Commodore 64 but again it could be easily adapted for any other machine. It calculates the number of moles in any given quantity of a substance — a technique frequently used in chemistry.

Program notes

1-60 Introduction
70-160 Input state of substance.
1000-1510 Calculates moles if the substance is a gas.
2000-2030 If substance is in solution.
3000-3030 If substance is a solid or a liquid.

Variables:

T Delay loop.
A$ Input choices.
V Volume.
M Molarity.
RMM relative molecular mass.
MA Mass.

```
1 REM 'MOLES  BY SARAH COTTON
10 PRINT "QQ        MOLES     ":POKE3687
9,27
20 PRINT "QQ]THIS PROGRAM WILL
30 PRINT Q]CALCULATE THE NUMBER
40 PRINT Q]OF MOLES IN ANY'
50 PRINT Q]GIVEN QUANTITY OF A':PRINT Q]
SUBSTANCE.
60 FORT=1TO4000:NEXT
70 PRINT "QQ←]PLEASE INPUT THE'
80 PRINT Q]NUMBER OF THE STATE'
90 PRINT Q]OF THE SUBSTANCE:
100 PRINT QQ←]1. GAS
110 PRINT Q]2. SOLUTION
120 PRINT Q]3. SOLID/LIQUID
130 GETA$:IFA$< 1 ORA$> 3 ORA$=  THEN130
140 IFA$= 1 THEN1000
150 IFA$= 2 TNEN2000
160 IFA$= 3 TNEN3000
1000 PRINT "QQQQQQQQQQ]INPUT VOLUME (CM↑
3)
1010 INPUT Q]] :V
1020 PRINT "QQQQQQQ]←]IS THE GAS AT:
1030 PRINT Q] 1.ROOM TEMPERATURE
1040 PRINT ]]AND PRESSURE
1050 PRINT Q]←2.STANDARD
1060 PRINT ]]TEMPERATURE AND
1070 PRINT ]]PRESSURE.
1080 PRINT QQ←]]]CHOICE ?
1090 GETA$:IFA$< 1 ORA$> 2 ORA$= "THEN10
90
1100 IFA$="2 THEN1500
1110 PRINT"QQQQQQQQQQ]]]NO. OF MOLES
1120 PRINT Q]]]]- .V/24000:END
1500 PRINT "QQQQQQQQQQ]]]NO. OF MOLES
1510 PRINT Q]]]]- :V/22400:END
2000 PRINT "QQQQQQQQQ]] MOLARITY ::INPUTM
2010 PRINT QQ←]]VOLUME(CM↑3) ;:INPUTV
2020 PRINT "QQQQQQQQQQ]]]NO. OF MOLES
2030 PRINT Q]]]]- :V*M/1000:END
3000 PRINT "QQQQQQQQQ]] RMM ::INPUTR
3010 PRINT QQ←]]MASS ::INPUTMA
3020 PRINT "QQQQQQQQQQ]]]NO. OF MOLES"
3030 PRINT Q]]]]- .MA/R.END
4000 REM PROGRAMMING INSTRUCTIONS (NO NE
ED TO TYPE THESE IN)
4010 REM  " =CLR
4020 REM  ] =CRSR RIGHT
4030 REM  Q =CRSR DOWN
4040 REM  ← =RED
4050 REM  _ =PURPLE
4060 REM  ← =BLUE
4070 REM  2 =BLACK
```

Moles
by Sarah Cotton

Arcade Avenue

Japan success

To start off this week I have a few more *Sabre Wulf* scores to put into the Hall of Fame. J Dodd and his or her brother of Halesowen have completed the game, but are keeping their score secret for now — they advise that it is vital to make a map, as does Mr N C Barker of Weston Super Mare who has a high score of 91445 in only 63% of the maze. He has also finished *Atic Atac* with a score of 99% (remember I am also keen to hear of low percentages for these games).

Colin Graig of Kirkcaldyn has completed *Wulf* with 117540 and 83% "after seven hours of intense concentration at 6 45 on Tuesday June 26th.

Now on to pastures new — Richard Couchman of Huntingdon has sent in some marvellously original pokes for the *Horace* series of games. With *Horace goes Skiing*, *Poke 30027,0 Poke 30644,0* ensures that there is no ski charge. *Poke 2009,0* and *Poke 25045,0* removes the cars from the frogger stage and *Poke 30763,0* means that there is no ambulance fee.

Pokeing 27680 0 on *Horace and the Spiders* gives only one life (for masochists maybe? Perhaps some different numbers would be better) and *Poke 24960,0* and *25142,0* allows you to skip the first stage which suits me as I find it a boring impediment to the main game. Richard also offers the technical tip that he gets a better *Save* using the Ear socket of his Spectrum.

R Blake of Rayleigh in Essex, my old stamping ground, sent in some comments about the best of the new Sinclair games. Concerning *Match Point* it is easy to miss the graphics of the trophy as you must give a key press to view the screen and another press to continue, unless you give a light, quick tap the computer reads it as two key presses and moves straight on.

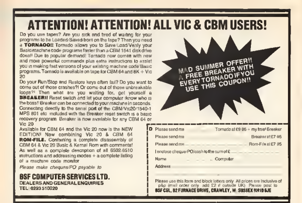
On to *Stop The Express*: "Talk about addictive — the day I bought the game I spent eight hours before finally managing to stop the train! Could the fact that it was written in Japan explain the message "Congratulation! You Sucsess!" which accompanies the graphics of the train's engine?"

Well, I had always given them the benefit of the doubt and assumed the wacky spelling to be deliberate (unless no one at Sinclair could finish the game to check it) but I must agree it is one of the best for the Spectrum. Although not really technically breathtaking, it has been so well designed that it could almost pass as a true arcade game.

Finally, there can be few Commodore programmers regarded with more respect than Jeff Minter yet the reception of his games when converted to the Spectrum has been very iffy. Somehow they lose their legendary awesomeness in transit. In part this is due to the weedy Spectrum sound, but it is also due to the fact that conversions to date have been old Vic20 games which look poor against the likes of Ultimate. The good news is that we can soon expect a conversion of the more ambitious and wonderful CBM 64 game *Hover Bovver*.

Tony Kendle

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame!) then write to Tony Kendle, Arcade Avenue, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD


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Pacman's Revenge

on BBC

Pacman's Revenge, is a delightfully (I hope) simple game. All you have to do is catch Super Ghost III (the one with a big bite) who is lurking underneath you. (In case you might not know who you are, you are the 'C' shaped character.)

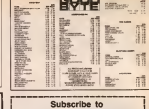
This program consists of two parts; the loader program, and the game itself. It was designed for the BBC B but will also run on the Acorn Electron if the *Mode 7* commands are changed to something suitable. It is a pretty good program for its size.

```
.0 *KEY10"OLD.MRUN|M"
20 ONERRORRUN
30  MODE7
40 PRINT:PRINT:PRINT:PRINT"       Pac-Man's Revenge'''"
50 PRINT:PRINT'        By Nilesh Ramrattar'
60 PRINT:PRINT:PRINT"You are Pac-man, And you are seeking "'"Revenge on the
D readed and mindless "''Supa-Ghost III ,but there is a slight"''"Problem."
''"You have 150 moves to make the most"'"of your mission.'''"Z=LEFT X=LEFT"
70 PRINT"   :=UP        /=DOWN"'
90  PRINT"Hit a key then start the tape recorder"
90  A$=GET$
.00  IF A$<>"0" THEN CHAIN"PACMAN"
10 *KEY 10"CLS'MOLD|MRUN'M"
20 ONERRORMODE7:PRINT:PRINT:PRINT"Another Go (Y/N)":GOTO 290
30 MODE2
40 VDU 23;8202;0;0;0;
50 A=5:B=A:C=15:D=C
60 FOR T=0 TO 150
70   GOSUB 330
80   COLOUR1:PRINTTAB(3,0);"Moves Used";T
90   COLOUR 6:PRINTTAB(C,D);CHR$240
100  COLOUR 3:PRINTTAB(A,B);CHR$241
110  G=RND(10):H=RND(10
120  IFG<5THENC=C+1
130  IFG>5THENC=C-1
140  IFH<5THEND=D+1
150  IFH>5THEND=D-1
160  R$=INKEY$(2000)
170   IFR$=":" THEN B=B-1
180   IFR$="/" THEN B=B+1
190  IFR$="Z" THEN A=A-1
200  IFR$="X" THEN A=A+1
210  IF C<0 OR C>20 THEN C=10
220  IFD<0ORD>30THEND=15
230  IF A=C AND B=D THEN MODE7:PRINT:PRINT:PRINT"YOU DID IT.............
";PRINT"Another go (Y/N)":GOTO290
240  IFA<0ORA>20THENA=4
250  IFB<0ORB>30THENB=7
260  NEXT T
270 CLS
280 MODE7:PRINTTAB(0,10);"YOU FAILED......................'":PRINTTAB(0,11);
"Another go (Y/N)"
290 INPUTA$
300 IFA$="Y"THEN RUN
310 IFA$<>"Y"THEN MODE7
320 END
330 VDU 23,241,24,126,127,240,240,127,126,24
340 VDU 23,240,124,182,254,254,254,254,170,170
350 CLS
360 RETURN

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```

Pacman's Revenge
by Nilesh Ramrattan





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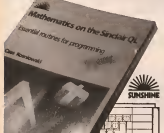
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Tony Bridge's Adventure Corner



Alien teeth

The Vic20 lives on. Despite the new machines arriving on the market, one of the oldest still has its devotees; one of which is Brenda Beresford of Tilehurst, Berkshire

"My Vic20 is in need of your help — no, not with Scott Adams (I've solved all five and great they were) I'm stuck in *Arrow Of Death Part 1* in fact, everybody I've spoken to is having the same problem — how do you enter the Giant's building and live to carry on? *Nosferatu* from Terminal Software is also a problem — where is the key to the shed? I rate Scott Adams 10/10 *Rescue from the Castle Dread* (Terminal again) 10/10 (although there is no congratulatory message!). *Magic Mirror* is also good. *The Colonel's House* is quite easy *Curse of the Werewolf* is a pain from beginning to end, I hate random adventures. *Trader*, not hard but I enjoy the colour and very good graphics — shows what the Vic can do. About to tackle *The Golden Baton*"

And from Mr L J Wilson of Newcastle "I've been stumped for over eight months in *Golden Baton* for my Vic20 How do I take the quartz from the magic room — typing *Help* reveals that "I need Magic", but I can't work out what this means Wearing the helmet and waving the staff doesn't help Any ideas? Incidentally, I noticed that Nick Walkland, in the Corner of 12-18 April had completed it, and I hope that, between you, you can give me some help. My adventuring to date: *Adventureland* — a good solid adventure. *Golden Baton*, see above. *Arrow of Death Part 1* — stuck in the same place as Nick Walkland. *Into the Labyrinth* — can't get past the Hydra to get at Ankh (there are some nice touches in this adventure). *The Colonel's House* — a pleasant change from "heroic" adventures, but not difficult."

So, Brenda and Mr Wilson are having trouble with the same adventures, and are in agreement with others. Nick Walkland, mentioned last in that corner of 12-18 April, was stuck in *Arrow of Death*, but I have since heard from him that he has finished the adventure. So, Nick, let us all know the answer to this problem. In the meantime, he has also finished *The Golden Baton, Perseus and Andromeda, Wizard of Akryz*, the Level 9 adventures, *The Hobbit, Mountains of Ket* and *Temple of Vran, Urban Upstart* — quite a list there, which includes some of the real toughies. If you're stuck in these, Nick will gladly answer your queries — write to him at 84 Kendal Road, Hillsborough, Sheffield, Yorkshire, including an SAE.

Staying with the Vic20, Gwynne and Ian Harper (of 97 Vivian Road, Sketty, Swansea West Glamorgan SA2 0YN) have some more questions about adventures that they are playing on their Vic — but first, a critical list of adventures they have completed. "*Wizard and the Princess*" (unexpanded, Melbourne House) 4/10 — not really an adventure, and it shows. Reasonable graphics, and a good 3D maze, but otherwise poor *The Dungeons* (16K, Anirog): 4/10 — again, good graphics, but you merely wander about a maze killing randomly-placed monsters. If you reach the finish before you die of boredom, then you are greeted with the prompt "Congratulations — now load *The Dark Dungeons.*" There's nothing else on the tape, but an Anirog advert shows that *The Dark Dungeons* is now sold separately. *Alien* (8K, Mac) 7/10· This is more like it, although it is not a true adventure True to the film, though — graphics are good, and careful strategy is needed to avoid being caught by the alien in a dead end. Your death, at the teeth of the alien, is entertaining The instructions (all 8K of them!) are an experience in themselves.

"*Zok's Kingdom* (16K, Anirog) 7/10· This one needs lateral thinking and fast reactions — the graphics are neat and well done.

"*Quest of Merravid* (19K, Martech) 4/10· took us 45 minutes to do! It creates a nice atmosphere occasionally, but this doesn't make up for the lack of any real puzzles *Into the Labyrinth* (16K, Abacus) 7/10· Many puzzles, quite hard unless you think logically We didn't like the *Help* command — they weren't cryptic clues as befit an adventure, but, rather, step-by-step instructions. *Rescue from Castle Dread* (16K, Terminal) 8/10· An excellent adventure. It has an extensive map when completed, and it took the creative talents of both my brother and I to finish it. Marilyn Boyce (The Corner, 31 May) should take the talisman with her in the balloon, as it is used to bribe the demon (you can only carry one thing in the balloon, or you'll lose height and crash!) To get past the warrior (same issue, G Shaw) is a long-winded affair" [I suggest you try writing to the Messrs Harper — see their address above].

"*The Pyramid* (8K, Mogul) 8/10· Considering that it is for the smaller memory very good indeed. Some of the locations are very difficult, and there are several odd inhabitants, like an aardvark (they like Ants!) and a mummy (any D&D fan knows that you have to burn them) Also, put objects in your knapsack, you can then carry up to nine.

"*Hitchhiker's Guide to the Galaxy* (16K, Supersoft) 9/10· Superb! This was written for the Pet, but we converted it to run on our Vic20, so I suppose it counts. This was our first adventure, and to my mind nothing else comes close

"Of the Scott Adams', we've completed *Pirate Cove* (the most fun), *Mission Impossible* (the easiest) and *The Count* (the hardest). We are now in the process of doing *Four Gates to Freedom* and can supply the loader code as well as various clues.

"Now, are there any versions of the Classic Adventure for the Vic? If *Pimania* fits on a 16K ZX81, why not a Vic? What about Brian Howarth's adventures?"

Thanks for a very interesting letter, Harpers I hope you don't mind your address being broadcast! If anyone wishes to write — please include a SAE.

To answer those last questions — no, I don't think there is a version of Classic Adventure available for the Vic, is *Pimania* actually available for the ZX81? Anyway, Automania seems only to be interested in Sinclair machines (with the occasional foray into Dragonland); Howarth's *Mysterious Adventures* are, I'm afraid, not available for the Vic.

[illegible] problems and [illegible] encounter So if you have an Adventure you want reviewed or if you are stuck in an Adventure and cannot progress any further write to Tony Bridge, Adventure Corner, Popular Computing Weekly, 12-13 [illegible]

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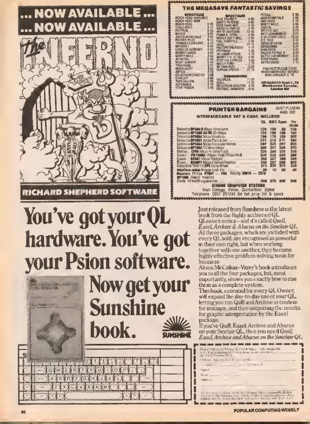
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....

Name ....

Address ....

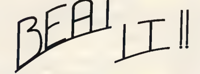
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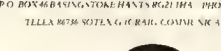


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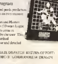
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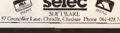


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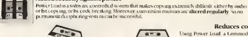
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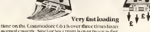
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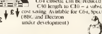
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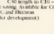
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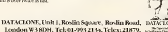
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Peek & Poke



File creation

Glen Pearsons of Redditch Worcs, writes:

Q I own a Vic20 and recently have transferred all my names, addresses and telephone numbers on to computer tape. The program I used for this is the example in the manual, suitably amended.

My question is, how do you create a file which you can write to at any time? By this, I mean write to it without having to type in all the information that was previously stored on the tape?

A As you have discovered, cassette tape is not a suitable medium for the handling of filed data. In order to update your file it will be necessary for you to read it in to your program first, make the necessary insertions, amendments or deletions, and then write the whole thing back to cassette. Normally a different cassette is used, so that if a tape error occurs you don't actually lose everything.

Statement lost

T M Birkett, Blackpool, writes:

Q I require help on two recent games published in your magazine. In *Gone Fishing* (vol 3 No 22), after entering the first three lines and RUN, I get the error *'Statement Lost'* every time.

In *Cobra* (vol 3 No 24) after entering the four lines in program 1 and *Running*, I am unable to input the data in a way the computer will accept. Can you help?

A REM statement in line 1 (of *Gone Fishing*) must be typed in exactly as it appears in the listing, or at least contain 25 or more characters. This is because the machine code statements (in the DATA statement on line 3) are *Poked* into the REM. If the REM statement has less than 25 characters in it, when line 2 is executed it is corrupted by the *Poke* it contains.

In *Cobra*, the instructions given are not very clear. What you should do is type in program 1 (four lines), Run it, and each time you are prompted for 'data' enter the next number in the list above. Eg, the first 10 numbers you should type in are 60 60 60 60 60 60 60 60 33 33 (first 8 from line A =, last two from line B =)

You will have to continue entering the data in this way, one number at a time until the program stops prompting. You should then *Save* your graphic characters, by *SAVE "udg" CODE USR "A", 168*. You can then type in the main program (without *Newing*) and run by using *GOTO 9998*.

Copy onto cartridge

R M Jones of Yelverton, Devon, writes:

Q I feel, in common with others an urgent need for Microdrive versions of Spectrum machine code programs. Is it not possible for us to be given the necessary instructions to copy on to cartridge ourselves, I want to load *Vu-File* on to Microdrive.

I require to file statistics on staff daily for a month, and need to use an array of x(31,25,12). This statement is promptly thrown out on the grounds of insufficient memory. How can this be overcome?

A I agree with you that means should be provided to enable Spectrum owners who have microdrives to put all their software onto microdrive cartridges. Unfortunately, these facilities are not being made available. Also, a lot of Spectrum software (*Vu-File* included) is incompatible with microdrives because of the memory locations they use. Short of rewriting these programs there is nothing you can do.

It is difficult to make constructive suggestions regarding your array problem, as I don't know what the subscripting represents. One possibility that comes to mind is that you file your statistics on a daily, rather than monthly basis (I guess that is the significance of the subscript 31).

If you think of it, an array of the size you require would occupy 92,000 bytes. The equivalent array in character form would only take 9,300 bytes (Spectrum numbers are stored in floating point form). If you, therefore, stored your data in character form and converted it to numeric form when you wanted to use it (using *Val*), you might be able to squeeze your program in.

Saving to tape

B C Walther of Christchurch, Dorset, writes:

Q I have a CBM 64 computer and have been experimenting via a Data statement. I can remove all the Basic statements, leaving just the machine code in memory, but I cannot find any means of saving the machine code to tape. Can you advise me please?

My second question concerns the use of memory limitation to protect user defined graphics from being overwritten. Many writers use *Poke 52,48:Poke 56, 48* which immediately sets the upper limit of memory available to Basic to 12288. Why should this very high amount of memory be lost to me?

A A fairly simple way to save machine code programs on the CBM is to use the following direct commands:

```
PRINT (start address/256 - INT (start address/256))*256
PRINT (INT(start address/256))
PRINT (end address/256 - INT (end address/256))*256
PRINT (INT(end address/256))
```

We can now enter:

```
POKE 43,v1: POKE 44,v2: POKE 45,v3:
POKE 46,v4:
SAVE "program name" 1,1
```

The values for v1,v2,v3 and v4 are obtained from the four print statements.

The reason that location 12288 decimal is normally used as the start address for UDG's is due to the fact that the Vic chip can only access 16K at any one time (of memory that is). Thus, if you located your UDG's higher up in memory, you would have problems in accessing them.

Pixel by pixel

Howard Jones of Bracknell, Berkshire, writes:

Q I am writing to ask if you know of a sideways scroll routine which scrolls the bottom two thirds of the screen pixel by pixel. I am only just starting in machine code so I could not write such a routine myself. Also, can you recommend a book for arcade game programming which covers sound, graphics, special effects, etc?

A Unfortunately, you have forgotten to tell me which machine you have, so all I can do is list a few books which cover the subjects you mention.

Supercharge Your Spectrum, published by Melbourne House. *Advanced Graphics with the BBC Microcomputer*, published by MacMillan. *Commodore 64 Sound and Graphics*, published by Melbourne House, and *Sprites and Sound on the Commodore 64*, published by Duckworth.

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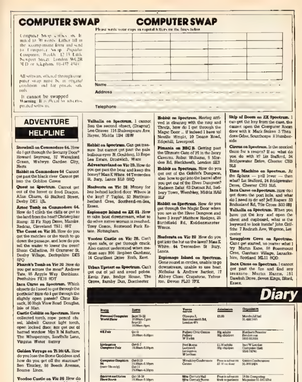
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The Count on Vic 20. How do you get the matches or the torch to go down the passage, and how do you tell the waiter to lower the oven? Shaun Calladine, 39 Grammer St, Denby Village, Derbyshire DE5 8PQ

Pharoh's Tomb on Vic 20 How do you get across the moat? Andrew Tate, 85 Argyle Way Dunblane Perthshire FK15 9DY

Inca Curse on Spectrum. Which objects do I need to get through the porthole? How do I get through the slightly open panels? Chris Kissack, 30 High View Road Douglas, Isle of Man.

Castle Colditz on Spectrum. Have collected torch, rope pencil chisel, lifebelt Cannot light torch, open locked door nor get out of barred window Mrs R M Batham, The Whisperings, Sandhills Lane, Virginia Water Surrey

Golden Voyage on Ti 99/4A. How do you lose the Stone Goddess and how do you get off the staircase? Ben Thurley, 58 Beech Avenue, Bourne Lincs.

Voodoo Castle on Vic 20 How do you get the Ju Ju Bag and how do you remove the wooden boards up the chimney. Ian Murray 18 Eskombe Drive, Hunts Cross, Liverpool.

Valhalla on Spectrum. I cannot find the second object, (Drapnir) Lee Graves 114 Shakespeare Ave, Hayes, Middx UB4 0BW

Hobbit on Spectrum. Can get treasure but cannot get past the pale bulbous eyes N Goulding, 13 Rope Lea Estate, Droitwich, Worcs

Adventureland on Vic 20. How do you get past the bear and keep the honey? Miss K White 44 Tenterden St, Bury, Lancs BL9 0HQ

Nosferatu on Vic 20 Money for bus behind locked door Where is the key? F Taylor, 33 Northumberland Cres, Southend-on-Sea, Essex.

Espionage Island on ZX 81 How to take boat downstream, what to do when native woman is reached. Tony Coxon, Bestwood Park Estate, Nottingham.

Voodoo Castle on Vic 20. Can't open safe, or get through crack. Also cannot understand when medium says B96 Stephen Gardner, 14 Courtfleet Drive Erith, Kent.

Urban Upstart on Spectrum. Can't get out of jail and avoid police Kevin Finn, Bridge House, The Grove, Barnby Dun, Dorchester

Hobbit on Spectrum. Having arrived in cleaning with the ring and Thorin, how do I get through the Magic Door ... if indeed I have to! Neville Wright, 10 Deane Road, Edgehill, Liverpool.

Pimania on BBC B Getting past the Ultimate Gate of Pi in the Ivory Caverns. Robin Williams, 8 Morden Rd, Blackheath, London SE3

Hobbit on Spectrum. How do you get out of the Goblin's Dungeon, also how to get into the barrel after you get out of the Elves Dungeon? Nadeem Zafar 63 District Rd, Sudbury Town, Wembley, Middx HA0 2LF

Hobbit on Spectrum. How do you get through the Magic Door when you are in the Elves Dungeon and have 3 keys? Matthew Hodges, 35 Birchfield Rd, Kidderminster Worcs.

Nosferatu on Vic 20 How do you get into the hut on the lawn? Miss K White, 44 Tenterden St Bury, Lancs.

Espionage Island on Spectrum. Gone round in circles, unable to go downstream, unable to use boat. Nicholas & Andrew Bartlett, 17 Abbey Close Crapstone, Yelverton, Devon PL20 7PX.

Ship of Doom on ZX Spectrum. I can get the key from the case, the cannot open the Computer Room door with it Mark Stokes 3 Theadore Gdns, Scunthorpe S Humberside

Circus on Spectrum. Is the snorkel there for a reason? If so what do you do with it? Liz Stafford, 24 Bridgewater Drive, Chester CH3 5LS

Time Machine on Spectrum. At the Sphinx — pull lever — then what? Liz Stafford, 24 Bridgewater Drive, Chester CH3 5LS.

Inca Curse on Spectrum. How do I get down the port hole, and what do I need to do so? Jeff Rogers 53 Bridusland Rd, Tile Cross B33 0BJ

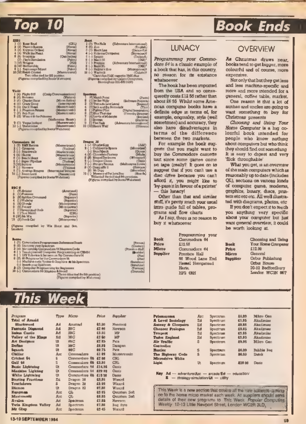
Valhalla on Spectrum. When you have got the key and open the chest and cupboard, what is the keyword to look inside? John Griffiths 7 Redruth Ave, Wigston, Leicester

Smugglers Cove on Spectrum. Can't get started, no matter what I try Martin Kane, 56 Rosemount Cres, Carstairs Village, Lanarkshire, Scotland ML11 8QD

Inca Curse on Spectrum. I cannot get past the fire and find any treasure Martin Harris, 151 Dawlish Drive, Seven Kings, Ilford, Essex.

Diary

Event	Dates	Venue	Admission	Organisers
Personal Computer World Show	Sept 19-22 10.00am-7pm Sept 23 10.00am-6pm	Olympia 2, Hammersmith Rd, London W14	£3.00	Montbuild Ltd 01-486 1951
6E Fair	Oct 6 10.00am-5.00pm	Pudsey Civic Centre Pudsey W Yorks	80p adults 50p children	Northern Promoter [illegible] 0532 [illegible]
Livingston Computer Fair	Oct 6-7 10.00am-5.00pm	Fort Rooms Ladywell Livingston W Lothian	£1.00 adults 60p children	Inst W Lothian Computer Club 0506 [illegible]
Computer Graphics 84 (over 18s only)	Oct 9-10 10.00am-6.00pm Oct 11 10.00am-4.00pm	Wembley Conference Centre	Free in advance £5.00 on door	Online Conferences 01-868 4466
Spectrum and Sinclair Show North	Oct 18-19 10.00am-6.00pm	[illegible] Century Hall [illegible] Century House Corporation Street Manchester	Free in advance from organisers	18 [illegible] Computing Magazine 01-841 [illegible]
Computer Centres and Systems Retailer Show (trade only)	Oct 17-18 9.00am-6.30pm	Novotel London W6	Free	Maree Exhibitions [illegible]



Top 10

ZX81

1 (1) Rocket Raid (CRL)
2 (2) Planet Rescue (Novus)
3 (3) Krypton Ordeal (Novus)
4 (4) Walk the Plank (Novus)
5 (5) Scrabble (Quicksilva)
(7) Flight Simulation (Psion)
7 (10) Dragon (PSS)
8 (10) Mothership (Psion)
9 (-) Espionage Island (Psion)
10 (10) [illegible] Crystal (Mastertronic)
Two titles tied for 5th position
(Figures compiled by Boots/Websters)

Atari

1 (1) The Hulk (Adventure International)
2 (6) Ace (English)
3 (1) Bruce Lee (Datasoft)‡
4 (-) Hideous [illegible] (Novagen)†
5 (-) Zaxxon (Datasoft)
6 ( ) Match 85 (OSS)*
7 ( ) Preppie (Adventure International)
8 (-) Basic XL (OSS)*
9 (-) Hellcat Ace (Microprose)†
10 (-) Warlock (Calisto)†
*Cartridge †48K cassette ‡48K disc
(Figures compiled by Calisto Computers, Birmingham 021-632 6458)

Vic 20

1 (4) Flight 015 (Craig Communications)
2 (3) Snooker (Visions)
3 (6) Chariot Race (Micro Antics)
4 (3) Crazy Kong (Interceptor)
5 (1) Duck Shoot (Mastertronic)
6 ( ) Phantom Fortress (Mastertronic)
7 (8) Sub Hunt (Mastertronic)
8 (2) Wizard & the Princess (Melbourne House)
9 (7) Vegas Jackpot (Mastertronic)
10 (-) Undermine (Mastertronic)
(Figures compiled by Boots/Websters)

Spectrum

1 (?) Match Point (Psion)
2 (1) Jet Set Willy (Software Projects)
3 (3) Tornado Low Level (Beyond)
4 (?) Jack and the Beanstalk (Thor)
5 ( ) Fighter Pilot (Digital Integration)
6 (7) Blue Thunder ([illegible])
7 (4) Lords of Midnight (Beyond)
8 ( ) Zaxxon (Starzone)
9 ( ) The Hulk (Adventure International)
10 (10) Sabre Wulf (Ultimate)

Commodore 64

1 (5) BMX Racers (Mastertronic)
2 ( ) Gyropod (Taskset)
3 (-) Spacewalk (Mastertronic)
4 (4) Hunter (Mastertronic)
5 (1) Beach Head (Centresoft)
6 (-) Super Pipeline (Taskset)
7 (10) Squirm (Mastertronic)
8 ( ) Snooker (Visions)
9 ( ) Arabian Knights (Interceptor Micros)
10 (-) [illegible] Lord ([illegible])
(Figures compiled by Boots/Websters)

Dragon 32

1 (-) Chuckie Egg (A&F)
2 ( ) Cuthbert in Space (Microdeal)
(-) Hunchback (Ocean)
4 (8) Chocolate Factory (Mikro)
5 (8) Ring of Darkness (Wintersoft)
6 (-) Dragon Chess (Oasis)
7 (-) Hungry Horace (Melbourne House)
8 (2) Computer 1 (Hewson)
(8) Mr Dig (Microdeal)
10 ( ) Mystery of the Java Star (Shards)
Titles tied for 2nd and 8th positions.
(Figures compiled by Boots/Websters)

BBC B

1 (7) Aviator (Acornsoft)
2 (1) Fortress (Pace)
3 (9) Spitfire Command (Superior)
4 ( ) Wallaby (Superior)
5 (4) Ghouls (Micropower)
6 (5) Frenzy (Micropower)
7 ( ) [illegible] (Superior)
8 ( ) Test Match (CRL)
9 (10) Mr Wiz (Superior)
10 (3) Stock Car (Micropower)

(Figures compiled by Wiz Shop and Son, London)

Books

1 (1) Commodore Programmers Reference Guide (Pitman)
2 (2) Discover your Spectrum (Century)
3 (4) Mastering Commodore 64 Machine Code (Prentice-Hall)
4 ( ) Teach yourself Computer Programming on CBM64 (Hodder)
5 ( ) DIY Robotics & Sensors on the Commodore 64 (Pan)
6 (3) 60 Programs for the Commodore 64 (Pan)
(-) Machine code Sprites & Graphics on the Spectrum (Sunshine)
(-) Inside your Spectrum (Sunshine)
9 (7) Computer Programming for Beginners (Fontana)
10 (-) Commodore 64 Graphics & Sound (Granada)
(Three titles tied for 6th position)
(Figures compiled by Websters)

Book Ends

LUNACY

Programming your Commodore 64 is a classic example of a book that has, in this country, no reason for its existance whatsoever

The book has been imported from the USA and so consequently costs £12.55 rather than about £6.95. Whilst some American computer books have a definite edge in terms of, for example, originality, style (well sometimes) and accuracy, they also have disadvantages in terms of the difference between the two markets.

For example the book suggests that you might want to buy the Commodore cassette unit since some games come on tape (really? It goes on to suggest that if you can't use a disc drive because you can't afford it, you might like to 'by-pass it in favour of a printer' — this lunacy!

Other than that and similar stuff, it's pretty much your usual intro guide full of tables, programs and flow charts

As I say, there is no reason to buy it whatsoever

Book	Programming your Commodore 64
Price	£12.55
Micro	Commodore 64
Supplier	Prentice Hall 66 Wood Lane End Hemel Hempstead Herts. HP2 4RH

OVERVIEW

As Christmas draws near, books tend to get bigger, more colourful and of course, more expensive.

Not only that but they get less and less machine-specific and more and more intended for a general, coffee table, market.

One reason is that a lot of aunties and uncles are going to want something to buy for Christmas presents

Choosing and Using Your Home Computer is a big colourful book intended for people who know nothing about computers but who think they should find out something. It is easy to digest and very 'flick throughable'

What you get, is an *overview* of the main computers which is reasonably up to date (includes QL), sections on various kinds of computer game, modems, graphics, binary, discs, printers etc etc etc. All well illustrated with diagrams, photos, etc

If you don't expect it to teach you anything very specific about your computer but just want general overview, it could be worth looking at.

Book	Choosing and Using Your Home Computer
Price	£12.99
Micro	General
Supplier	Orbis Publishing Orbis House 20-22 Bedfordbury London WC2N 9ST

This Week

Program	*Type*	*Micro*	*Price*	*Supplier*
Trial of Arnold Blackwood	Ad	Amstrad	£5.80	Nemesis
Fantasia Diamond	Ad	BBC	£7.95	Hewson
Imbas Castle	Ad	BBC	£3.00	MP
Valley of the Kings	Ed	BBC	£7.50	MP
Art Designer	Ut	BBC	£7.95	Pica
Define	Ut	BBC	£8.95	Datapen
Squash	Ut	BBC	£9.75	Pica
Chiller	Arc	Commodore	£1.99	Mastertronic
Cricket 64	S	Commodore 64	£7.00	CRL
Golf 64	S	Commodore 64	£3.90	CRL
Basic Lightning	Ut	Commodore 64	£14.95	Oasis
Machine Lighting	Ut	Commodore 64	£29.95	Oasis
White Lightning	Ut	Commodore 64	£19.95	Oasis
Starting Fractions	Ed	Dragon 32	£5.95	Wizard
Touchdown	S	Dragon 32	£5.95	Wizard
Diamon	Ut	Dragon 32	£7.95	Wizard
Hangman	Arc	QL	£9.95	Quantum Soft
Mastermodit	Arc	QL	£9.95	Quantum Soft
Avalon	Ad	Spectrum	£7.95	Hewson
Twin Kingdom Valley	Ad	Spectrum	£7.95	Bug Byte
Mr Clup	Arc	Spectrum	£5.45	Wizard
Pyjamarama	Arc	Spectrum	£6.95	Mikro Gen
A Level Sociology	Ed	Spectrum	£9.95	Akadimias
Antony & Cleopatra	Ed	Spectrum	£9.95	Akadimias
Chaucer Prologue	Ed	Spectrum	£9.95	Akadimias
Tempest	Ed	Spectrum	£9.95	Akadimias
Tudor England	Ed	Spectrum	£9.95	Akadimias
Air Traffic Controller	S	Spectrum	£9.95	Mikro Gen
Bustler	S	Spectrum	£6.99	Bubble Bus
The Highway Code	S	Spectrum	£6.50	Dutek
Microdrive White Light	Ut	Spectrum	£19.95	Oasis

Key Ad — adventure/Arc — arcade/Ed — education/
S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to This Week, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

New Releases

Tape office

What the Mini is to the Rolls Royce *Mini Office* is to integrata business software like *Lotus 1-2-3*

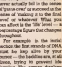
Mini Office for the standard 32K micro includes a database, wordprocessor, spreadsheet and simple graph program all on one tape. More than that, information can be moved from one program to the other so that, for example, information from the spreadsheet may be fed to the graph program.

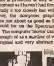
The wordprocessor will count words, let you correct text with a cursor and produce double-sized letter and print out the end result. The database lets you set up simple files, of both text and numbers and add, list and examine records You can replace strings, search fields and sort records into alphabetical or numerical order. The spreadsheet works exactly as a normal spreadsheet manipulating figures according to given mathematical rules. Finally the graph program draws simple but graphs based on the figures

Obviously none of the programs offer comprehensive facilities but all are genuinely functional. Being tape based w a problem but there is a disc version for those who have one.

At £5.95 it has to be worth considering

Program	*Mini Office*
Price	*£5.95*
Micro	*BBC B*
Supplier	*Database Publications 68 Chester Road Hazel Grove Stockport SK7 5NY*





Bubloid

A new program has arrived from Software Farm — the company which has somehow managed to get high resolution programming from the ZX81 and produce games that have made the odd Spectrum owner jealous.

The game — *Rocket Man* — is basically of the platforms and ladders variety with plenty of other things thrown in. The aim of the game is to collect diamonds from one side of the screen with the aid of a freshly fueled rocket pack found on the opposite side

To get the fuel you must run and jump along the platforms and up and down the ladders collecting the fuel pods necessary for the flight to the diamonds However, your flight can become blocked by a rampant bubloid which does unpleasant things to you if it catches you.

Later screens have more complex mazes of ladders and replace the jet pack with a vulture (which requires legs of lamb rather than fuel for sustinance.)

Arcade fans who are still sticking to their ZX81 shouldn't miss this one.

Program	*Rocket Man*
Price	*£5.95*
Micro	*ZX81*
Supplier	*Software Farm 155 Whiteladies Road Clifton Bristol BS8 2RG*



Movie, movie

About *Deus ex Machina* there is almost too much to say

It's like a breath of fresh air compared with 99% of the material I receive each week — all the colourful multi-screen collect the and dodge the but watch out for the.. loony len, digger dan, furtive freddie and other alliterative nonentities which pass for inventiveness.

Deus ex Machina is different. About as different and as rare as a truly great pop song It is a completely new computer experience

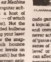
Above all, *Deus ex Machina* brings drama to computer software (aside from a host of specific new ideas — of which more in a moment). Not the drama of the dreaded bulbous thwarks threatening your laser base (heavens!) or the snapping blimps which bounce a round the higher levels on the sixth screen (gosh!) but the drama of the widescreen epic Not profound maybe, but still able to stir the emotions a little.

To specifics. *Deus ex Machina* is a package consisting of two tapes and a poster-come-script on which the words to the songs and the dialogue is printed. The first tape is around 90K of computer program, loaded, obviously in two sections. The second tape contains music, singing and dialogue and features notables like Ian Dury, EP Thompson, Jon Pertwee Donna Bailey (OK, so she isn't all that notable but she should be) and, playing the baddie, Frankie Howard.

This tape is ingeniously syncronised to the computer tape via a counted intro by John Pertwee after which the whole music and animation drama unfolds. The plot, is part sf, part fairy tale, part bleak 1984 totalitarian vision and concerns itself with the constant Automata themes of non-violence, nonsexism, humour, irreverance and not least, determined unconventionality It is the story of the creation of life by the 'central computer' from a quantity of mouse droppings deposited shortly before the death of the last mouse on Earth.

I have on idea whether the plot is profound or silly at the moment as I haven't had time to study it too closely but either, way, the computer graphics are just about as good as they could be on the Spectrum.

The computer 'movie' can be thought of as a number of very original and very abstract ar-



cade games strung together in a logical sequence Since tape and computer are linked you never actually fail in the sense of 'game over' or succeed in the sense of 'making it to the final level' or whatever What you can affect is the 'life' level — a percentage figure that changes throughout.

For example in the initial section the first strands of DNA must be kep alive by your cursor — the baddies are, at all times, trying to prevent life forming The screen displays beautifully detailed slowly turning strands, the music plays, and like some abstract version of plate spinning you move your cursor around. It's satisfying as an arcade game but quite different from the usual zapping experience

If it has a fault it is only a doubt in my mind about whether you will want to play *Deus ex Machina* over and over — maybe it will suffer a similar fate to all those horrendous seventies concept albums. Whatever happens *Deus ex Machina* is a brave new idea.

Program	*Deus ex Machina*
Price	*£15*
Micro	*Spectrum*
Supplier	*Automata 27 Highland Road Portsmouth Hants*

Stageplay

Hutchinson Computer Publishing is a section of the Hutchinson book publishing group shortly to release two programs for the Spectrum — similar in format but differing in plot — two programs for the Spectrum *Fire on the Water* and *Flight from the Dark*.

These are also Parts 1 and 2 of the Lone Wolf role-playing adventure books and the plot of both game and book is the same

What you get essentially, is the book but with all the decisions you make illustrated by animated graphics — the end result is superb, a little like *Valhalla* in some ways but quite original in its approach.

You begin in *Flight from the Dark* at a monastry where you decide how equipped for the adventure to come you will be This takes the form of a fight with your master — there are keyboard controls for Thrust, Parry, Advance, Retreat etc and you battle it out with the Computer-controlled master. How well you do determines much of what will follow

The monastry is attacked and you begin the adventure — half the screen becomes like the stage of a theatre you walk on and text describes the location and lets you choose from a

You find objects, baddies, goodies, shelter, danger, quests, a wide variety of weapons and hundreds of different screens of adventure. You get arcade spills and thrills by doing battle via the keyboard with a wide variety of odious looking monsters and you get the more cerebral pleasure by deciding what action to take at each point, as in an adventure The programs complete with booklet and overlay will cost £8.95 which is definitely cheap number of options Whatever you choose the scene will change with 'curtains' opening and closing to shift the scene.

Program	*Flight in the Dark*
Price	*£16.95*
Micro	*Spectrum*
Supplier	*Hutchinson Computer Publishing* *Hutchinson House* *17-21 Conway Street* *London W1P 6JD*

Bouncing

Tiler is a high-resolution arcade game from Interceptor Micro's that gets a few extra brownie points for bizarreness whatever else

The idea is to tile the roof of Rob Rubber (hey, guess what his chief quality is) getting the tiles from the garage via the garden and then fitting them in place.

Rob bounces around his house and gets in your way thereby making tiling extremely hazardous. And that's about it for the game really — you have stairs to climb and three screens of high-res house-complete with expensive looking sports car

The graphics are nice and it's not a bad game in a lot of ways, though it's really only a grab and dodge game with good background graphics.

Program	*Tiler*
Price	*£5.50*
Micro	*Spectrum*
Supplier	*Interceptor Micro's* *Lindon House* *The Green* *Tadley* *Hampshire*

Bearboy

Cheetahsoft has released a number of games to tie in with the release of its new RAT remote control joystick. One of them at least stands in its own right as a good new Spectrum release — *Bear George*.

The game is divided into three parts spuriously linked by the fact that they all concern the adventures of a bear called presumably, George

George first has to stock up on apples to build up fat for the long winter's hibernation. This involves standing under trees with your mouth open) you being a rather nice large sprite of a bear) this is pretty difficult, somewhat akin to trying to throw smarties in the air and catch them in your mouth. Occasionally a squirrel drops nasty garden apples on you resulting in your losing a life

The next screen involves trying to avoid skiers on the way to your cave (some nice scenery here) and the final action involves avoiding a number of spiders which are bobbing up and down on their threads, (Nothing spectactular here but some p0leasing graphics and good sound effects)

Program	*Bear George*
Price	*£6.95*
Micro	*Spectrum*
Supplier	*Cheetah Soft* *24 Bay Street*

No strings

Terrahawks is the most recent program from CRL and is based on the recent puppet series by Jerry Anderson (responsible for the sublime *Thunderbirds* amongst many others) The company seems to be doing a number of games based on TV series — it has a *Magic Roundabout* program in progress also

I must admit that I can't see that the plot of the game has much to do with the puppets, but then perhaps that doesn't matter very much.

The idea is to guide your ship into a Black Hole, into which you've been sucked and search for a vortex which will, eventually lead you out through the various strata of the hole and into space once more

The black hole is populated with huge green monoliths through which you must fly (unless you decide to blast them away). Radar can help you find the vortex but you will need your fuel and range metres since flying too high vast up energy quickly Lower down, however, ther are more monoliths.

Swings and roundabouts.

Program	*Terrahawks*
Price	*£6.90*
Micro	*Spectrum*
Supplier	*CRL* *CRL House* *9 Kings Yard* *Carpenter's Road* *London E15 2HD*

Monumental

Havoc is a pretty impressive new game for the Commodore 64 and, in a month or so, Spectrum. It's inspired by *Zaxxon* maybe, but graphically the game is fairly spectacular You fly a delta type fighter through nearly ten minutes worth of the skyscrapers, roads, vast monumental columns of some strange almost deserted city.*Zaxxon* comes in with the viewpoint, edge on at around 45 degrees with the whole thing scrolling top right to bottom left across the screen.

The city is not completely deserted, of course, somewhere at the far end of your flight you might, but probably won't, manage to fight out what it is that is launching missiles and air mines towards you. But dangerous adversaries isn't really the major problem — your passage through the city is impeded by vast columns and giant brick walls through which, somehow, you have to manoeuvre — usually guiding the jet through the tiniest of gaps and holding your breath.

Program	*Havoc*
Price	*£9.95*
Micro	*Commodore 64*
Supplier	*Dynavision Production Studio* *PO Box 96* *Luton LU3 2JP*

Water importance

I recently came down to London to cover the launch, at a hotel in Knightsbridge, of some new software for microcomputers

It looked as if I was going to be very early, but as Knightsbridge is next door to Hyde Park, I went via the park to see if they had moved the Serpentine

I came upon a cafe next to the water's edge, to find that the floor of the cafe was being sluiced with copious amounts of water Living in the North West, with dire warnings of the consequences of wasting water being an everyday part of life, I was shocked.

How, I wondered, can the GLC get away with the law in such a blatant manner? It was then that I realised: there is no water shortage in the South East of England.

The release of more computer software, however marvellous, was not going to have any impact on the car wash firms of the North West (banned from using water) The operation of the car washes might now be controlled by use of microprocessors, (I do not know), but without water there was nothing the car washes could do

This is the basic problem with information technologies which is summed up is the (aprocryphal?) story of the trade union leader in the USA confronted by a production line manned by robots Yes, he agreed, the robots were doing a grand job and did not need to have rest breaks, but "Do robots buy cars?"

It is a common, and correct, argument: the world does not exist for machines, it exists for people, and the needs of people have to be met before the needs of machines.

If, at any point, we start to put the needs of machines before the needs of people, then we start a process of dehumanization.

If we produce a world where all cars are produced by robot, (until the oil runs out), the numbers of cars purchased will decline because robots will be fabricating most industrial goods, and people will be out of work. The profits of manufacturing industries will therefore decline as more robots are used, and fewer and fewer people are working and therefore able to buy manufactured goods

Managers will disappear Once dealing with people is removed, management is easily automated. At the same time the infrastructure of our nation will be in tatters, and already it is beginning to get increasingly more tattered.

It is all a matter of priorities. For example, solving all the problems of maldistribution of water would probably cost less than all the money the Government is currently wasting on information technology

Isn't having an adequate water supply more important than spending money on teaching people how to use computers?

Leave learning about computers to private initiative, and let the Government spend money on useful tasks.

Water is more important than the Fifth Generation.

Boris Allan

Marathon jog

Puzzle No 124
Ever since it was announced that the town councillors would be running in the local marathon, a number of these worthy dignitories have been seen jogging around the gardens in front of the town hall.

The garden is rectangular in shape, and is bordered by a pathway around its perimeter. It also has two diagonal pathways, which run from corner to corner

Now the Lord Mayor has it on good authority from the County Surveyor that if a runner starts at one corner of the gardens, runs one circuit of the perimeter path, crosses the first diagonal, then runs the lengths of the *longer* side a second time, and finally runs along the other diagonal, the route will be exactly one mile long

What are the dimensions of the garden if the length, width and diagonals are all exact numbers in yards?

Solution to Puzzle No 119
From the information that we are given, we know that the width is between 9 and 100 feet, and the length — which is an exact multiple of the width is between 99 and 1000 feet. Further, these measurements and their product (the area), consist of the digits 0 to 9. Therefore, the area must have five digits

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10 FOR W = 10 TO 99 20 FACTOR = 2 30 L = W*FACTOR 40 IF L<100 THEN GOTO 190 50 IF L>999 THEN GOTO 210 60 PRODUCT = L*W 70 IF PRODUCT<10000 THEN GOTO 190 80 IF PRODUCT>99999 THEN GOTO 210 90 L$ = STR$(L) 100 W$ = STR$(W) 110 P$ = STR$(PRODUCT) 120 T$ = RIGHT$(L$,3) + RIGHT$(W$,2) + RIGHT$(P$,5) 130 FOR N = 1 TO 9 140 FOR M = N + 1 TO 10 150 IF MID$(T$,N,1) = MID$(T$,M,1) THEN GOTO 190 160 NEXT M 170 NEXT N 180 PRINT W$,L$,P$ 190 FACTOR = FACTOR + 1 200 GOTO 30 210 NEXT W
```

Note that lines 90–170 combine the three dimensions for duplication of digits. This reveals the solution. *Width* = 27 feet, *Length* = 594 feet, and *Area* = 16038 square feet.

Winner of Puzzle No 119
The winner is: Paul Thomas, Heol-y Forlan, Cardiff who receives £10

Rules
If the puzzle prize can be sensibly solved using a computer then the winner will have included a listing of the program used to find the correct answer. The closing date for entries to Puzzle No 124 is September 29

The Hackers



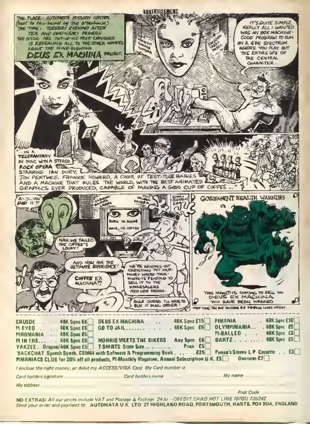











ADVERTISEMENT
THE PLACE: AUTOMATA MISSION CONTROL (next to rain-barrel by the greenhouse)
THE TIME: TUESDAY EVENING AFTER TEA AND COMPULSORY PRAYERS
THE SITCH: MEL 'OUT-OF-HIS-TREE' CROUCHER IS REVEALING ALL TO THE OTHER INMATES ABOUT THE MIND-BLOWING
DEUS EX MACHINA PROJECT.
WHOOSH YUMMA YUMMA
SWOOSH YABBA DABBA
IT'S QUITE SIMPLE, REALLY ALL I WANTED WAS AN 80K MACHINE-CODE PROGRAM TO RUN ON A 48K SPECTRUM WHERE YOU PLAY OUT THE ENTIRE LIFE OF THE CENTRAL CHARACTER
"... IN A TELEFANTASY IN SYNC WITH A STEREO ROCK OPERA STARRING IAN DURY, JON PERTWEE, FRANKIE HOWERD, A CHOIR OF TEST-TUBE BABIES AND A MACHINE THAT RULES THE WORLD, WITH THE BEST ANIMATED GRAPHICS EVER PRODUCED, CAPABLE OF MAKING A GOOD CUP OF COFFEE ..."
AND...YOU DID IT?'
KABOOM' BAMMA LAMMA
NAH WE FAILED THE COFFEE'S LOUSY!
WHITE, NO COFFEE
AND NOW FOR THE ULTIMATE EXPERIENCE!
COFFEE EX MACHINA??
WE'RE SENDING OUT CHRISTIAN 'PUT YOUR-MONEY WHERE YOUR-MOUTH-IS' PENFOLD TO SELL IT TO THE WHOLESALERS HEH HEH HEHHH
GULP GUESS I'LL HAVE TO BUY IT MAIL ORDER!
GOVERNMENT HEALTH WARNING
THIS MAN(?) IS COMING TO SELL YOU DEUS EX MACHINA YOU HAVE BEEN WARNED
NEXT TIME THE PLOT THICKENS BUT PENFOLD LOSES WEIGHT
CRUSOE ... 48K Spec £6
PI EYED ... 48K Spec £6
PIROMANIA ... 48K Spec £6
PI IN ERE ... 48K Spec £6
YAKZEE . Dragon/48K Spec £5
DEUS EX MACHINA .. 48K Spec £15
GO TO JAIL .... 48K Spec £6
MORRIS MEETS THE BIKERS Any Spec £6
T SHIRTS State Size ... Price £5
PIMANIA ... 48K Spec £10
OLYMPIMANIA .. 48K Spec £6
PI-BALLED ... 48K Spec £6
DARTZ .... 48K Spec £5
'BACKCHAT Speech Synth. CBM64 with Software & Programming Book £25
Piman's Stereo L P Cassette .. £3
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